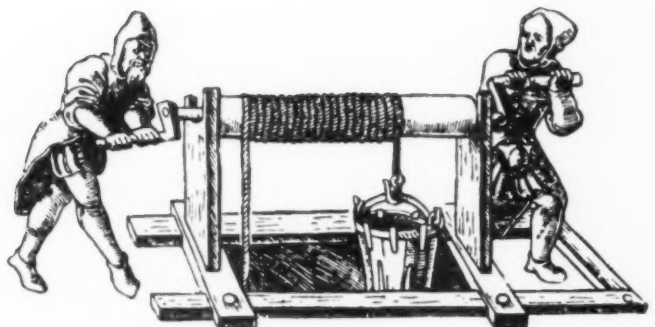


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MINING WORLD



APRIL 15, 1958






WEMCO World Standards in Mineral Processing...

FLOTATION • HEAVY MEDIA • GRAVITY CONCENTRATION


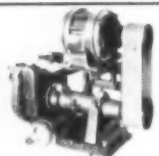


EQUIPMENT

FEATURES

SPECIFICATIONS

	WEMCO MOBIL-MILL	<p>Widely used for profitable production of marketable concentrates and low cost elimination of waste in treating metallic minerals, industrial minerals, coal and aggregate. Pre-engineered and pre-fabricated for maximum flexibility. Incorporates Wemco Drum type and Cone type separators for most accurate separations and highest recoveries.</p>	<p>Specific Gravity Range: 1.25 to 3.40 Capacity: 5 to 500 TPH Separatory Vessel: Cone Single Drum, Double Drum, 2-Compartment Drum.</p>
	WEMCO FAGERGREN FLOTATION MACHINES	<p>World standard of flotation in major operations with maximum capacity per cubic foot of floor space. Rotor-stator principle gives optimum pulp circulation and aeration for high metallurgical efficiency. New air control for increased cleaning efficiency. Special feed boxes eliminate costly pumping. Minimum adjustments.</p>	<p>Sizes: 12" to 66" Capacity: 1 to 50,000 TPD Rotor-Stator: Rubber or neoprene covered, stainless or alloy iron. Tank: Steel, wood, stainless, cement or rubber lined.</p>
	WEMCO SPIRAL CLASSIFIERS	<p>Slime-sand separations from 28 to 325 mesh. Single, double or triple spirals; tank options from straight side to full flare for desired settling area. Hydraulic lifting device available for starting under load without tank drainage. Sealed bearings, replaceable wearing shoes, continuous welded steel tube shaft assures long life.</p>	<p>Spiral Diameter: 12" to 90" Tank Length: 6' to 48" Raking Capacity: 5 to 24,000 TPD Wearing Parts: Alloy iron, stainless steel or rubber covered.</p>
	WEMCO REMER JIGS	<p>Ideal for concentration of large tonnages of ores where specific gravity differential exists and ratio of concentration is low. Provides exclusive differential acceleration — combined high and low frequency strokes — with live jig bed over entire surface.</p>	<p>Type: 2 hutch, 3 hutch Sizes: 5'x11' to 5'x16' Capacity: 30 TPH to 60 TPH per unit</p>
	WEMCO ATTRITION MACHINES	<p>Produce efficient inter-particle impingement in dense pulps of 65% to 80% solids, for scouring pulp grains, removing organic coatings or previously used reagents. Reverse propeller blade action for top pulp mixing with minimum contact time.</p>	<p>Cell Sizes: 10 or 20 cu. ft. Wearing Parts: Alloy iron, stainless, rubber or neoprene covered. Capacity: 5 to 100 TPH</p>

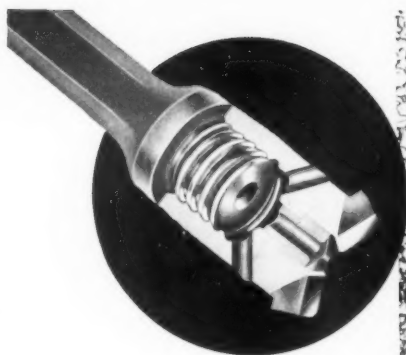
WEMCO PUMPS

	WEMCO DIAPHRAGM PUMP	<p>Widely used for handling dense pulp, sludges and other fluids with solids which wear or clog other pumps. Ideal for control of hydroseparator and thickener underflow. Adjustable speed and stroke. Fast takedown and replacement of parts.</p>	<p>Sizes: 2" to 4" Simplex Duplex Capacity: 5 to 100 GPM Construction: Fine grain iron, rubber valve seat, stainless steel or rubber covering.</p>
	WEMCO SAND PUMPS	<p>Handles pulps of sands, abrasive solids, slimes, slurries and heavy media; pumps flotation feed, concentrates and tailings. Used for HMS circuits, screen products and grinding mill discharge to classifiers. Change of wearing parts made readily.</p>	<p>Sizes: 1 1/4" to 8" Capacity: 20 GPM to 22 GPM Discharge Head: Up to 100 Ft. Pulps Handled: Up to 65% solids, particles up to 1/2"</p>
	WEMCO VERTICAL SAND PUMPS	<p>Provides performance of Wemco Sand pumps with added vertical application. Used for clean-up duty installed over sump or on cross members without need for separate dry pump pit. Can be mounted inside flotation concentrate launders for pumping concentrates.</p>	<p>Sizes: 1 1/4" to 4" Capacity: 20 GPM to 50 GPM Pulps Handled: Up to 65% solids, particles up to 3/4"</p>
	WEMCO TORQUE-FLOW PUMP	<p>New principle incorporates recessed impeller, continuous open passage. Permits pumping of large solids and tramp material in slurry without clogging. Wear is reduced since only small portion of slurry comes in contact with moving parts. Handles slurries with higher solids content than conventional pumps.</p>	<p>Sizes: 2"x2" and 3"x2" 8"x8" and 10"x8" Capacity: 50 GPM to 300 GPM Head: Up to 100 ft. Construction: Ni hard abrasive service.</p>

WEMCO®

Western Machinery Company

650 FIFTH STREET • SAN FRANCISCO 7, CALIFORNIA



UNRETOUCHED MICROPHOTOS PROVE THIS ROCK BIT IS MADE FOR HIGHEST PERFORMANCE

A

This is a 1200-times enlarged microphoto of the Sandvik Coromant tungsten carbide used in every Atlas Copco detachable rock bit. Uniformity of size and even distribution of grain shows these inserts are free of dangerous porosity and impurities—the reason why there is no bit tougher and more wear-resistant!

B

This is ordinary carbide. Black marks are contaminations, allowed by inefficient production and quality controls, that weaken the carbide, reducing the bit's useful working life.

Rock bits that give superior performance must have the highest grade tungsten carbide inserts obtainable anywhere. At Sandvik, every phase of production is controlled . . . from the very first stages of ore processing, right through to the final inserts. All bit bodies are made of world-renowned Sandvik alloy steel. These standard sizes are available:

	THREAD		DIAMETERS AVAILABLE (IN INCHES)															
	7/8" F	1 1/2	1 1/2	1 3/4	1 3/4													
SHOULDER TYPE	1" H	1 1/2	1 3/4	1 3/4														
	1-31/64" D					2	2 1/4	2 1/4	2 1/4	2 1/4	2 3/4	3						
	1-11/16" K											3	3 1/2	4	4 1/2			
	1 1/4" Rope				1 1/4	2		2 1/4		2 1/2								
	1 1/2" Rope									2 1/2	2 3/4	3	3 1/2	4				
BOTTOMING TYPE	2" Rope												3 1/2	4	4 1/2	5		
	400					2		2 1/4		2 1/2								
	600									2 1/2	2 3/4	3	3 1/2					

Shaded area indicates X-Bits

For further details on Sandvik Coromant detachable bits, contact:
ATLAS COPCO PACIFIC—930 Brittan Ave., San Carlos, Calif.
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DRILLS, PNEUMATIC EQUIPMENT

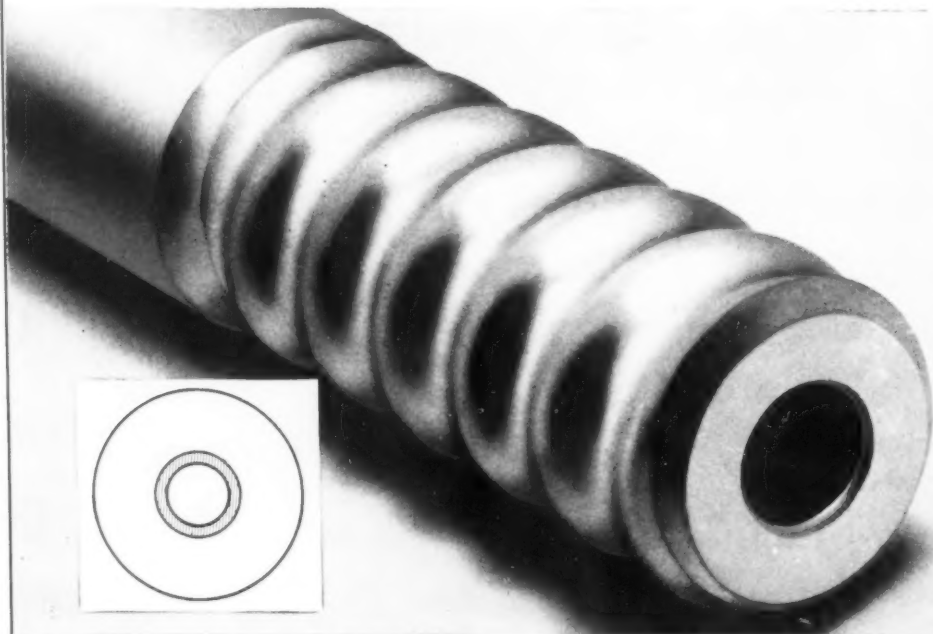
CATALOGUE, SURVEY & DIRECTORY NUMBER, 1958

ATLAS COPCO EQUIPMENT HELPS YOU OPERATE YOUR MINE EFFICIENTLY and with GREATER ECONOMY

Serving the mining industry
of the world with com-
pressed air equipment and
Sandvik Coromant drill
steels and carbide bits.



NEW ROPE-THREAD MAKES UNCOUPLING EASY with SANDVIK COROMANT EXTENSION STEELS



ROPE-TYPE THREADS AFFORD NO STARTING POINTS FOR FRACTURES

The connections used in extension drill-steel must be easy to assemble and uncouple, and the connections must not constitute weak links during the actual drilling.

Sandvik Coromant's new patented rope thread makes it easy to join and uncouple the equipment . . . yet gives a solid and positive connection. The gently rounded form of this thread means trouble-free performance—eliminates common thread and coupling failures found in "saw-tooth" threads.

Sandvik Coromant Extension Steels are made of world-renowned Sandvik alloy steel—another reason why they are tougher, more resistant.

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ROCK DRILLS, PNEUMATIC EQUIPMENT



THE ATLAS COPCO LION

DRILLS MORE FOOTAGE PER MANSHIFT

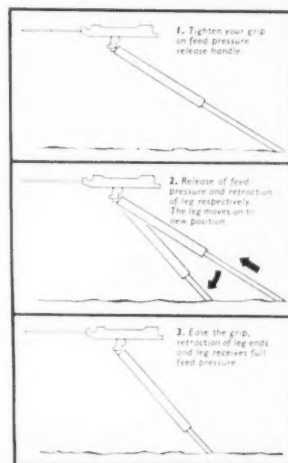
Atlas Copco rock drills and Sandvik Coromant steels and detachable bits—no drill or steel developed separately could ever give such equivalently high performances as this drilling combination.

The Atlas Copco Lion is the first pusher leg rock drill featuring automatic leg retraction with full operating control under the control of one hand. Packed with power, the Lion's drilling rate is at least 30% higher than other rock drills of the same weight.

Within easy finger-tip reach is the adjustable feed pressure lever.

The driller exerts moderate pressure on the hand grip control to release feed pressure... further depresses the control to retract the "stinger" in the leg. Releasing hand pressure automatically stops retraction and restores full feed pressure.

Next to the feed pressure is the lever for automatic water and air for pusher and drilling mechanism. For complete information, write for "Lion" folder—or phone collect to the nearest of these offices for a free jobsite demonstration.



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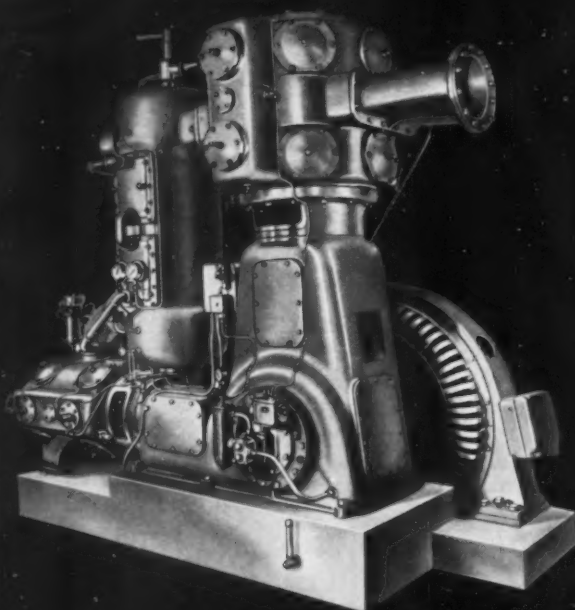
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Let us help you answer
these questions
about compressed air:



For further details on Atlas Copco AR compressors, contact:

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- Is compressor capacity enough to give full pressure throughout the entire air system?
- Can present compressor plant be improved by re-location and re-installation?
- Is the efficiency of present compressors such that it is advisable to continue running them?

Atlas Copco engineers are available to help you solve these problems and to give you the benefit of advice of specialists in all fields of compressed air engineering. Atlas Copco field offices give rapid service throughout the West.

Write for further information.

PRINCIPAL DATA

Conservative rating for 24-hour duty.

Model	Speed r.p.m.	Performance at 100 p.s.i.		
		Free air delivery c.f.m.	Power consumption h.p.	Cooling water cons. i.g.p.hr.
AR1*	600	330	62	300
AR3*	500	370	105	500
AR4*	450	795	146	725
AR5	360	960	177	850
AR7	327	1710	314	1500
AR9	300	3220	588	2900

*Portable skid-mounting available for semi-permanent installations.



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ON THE COVER

Hoisting in 1546, pictured by Georgius Agricola, shows a two-man windlass over a shallow shaft. Mining has changed. Check the catalog section of this issue for the latest equipment available in 1958.

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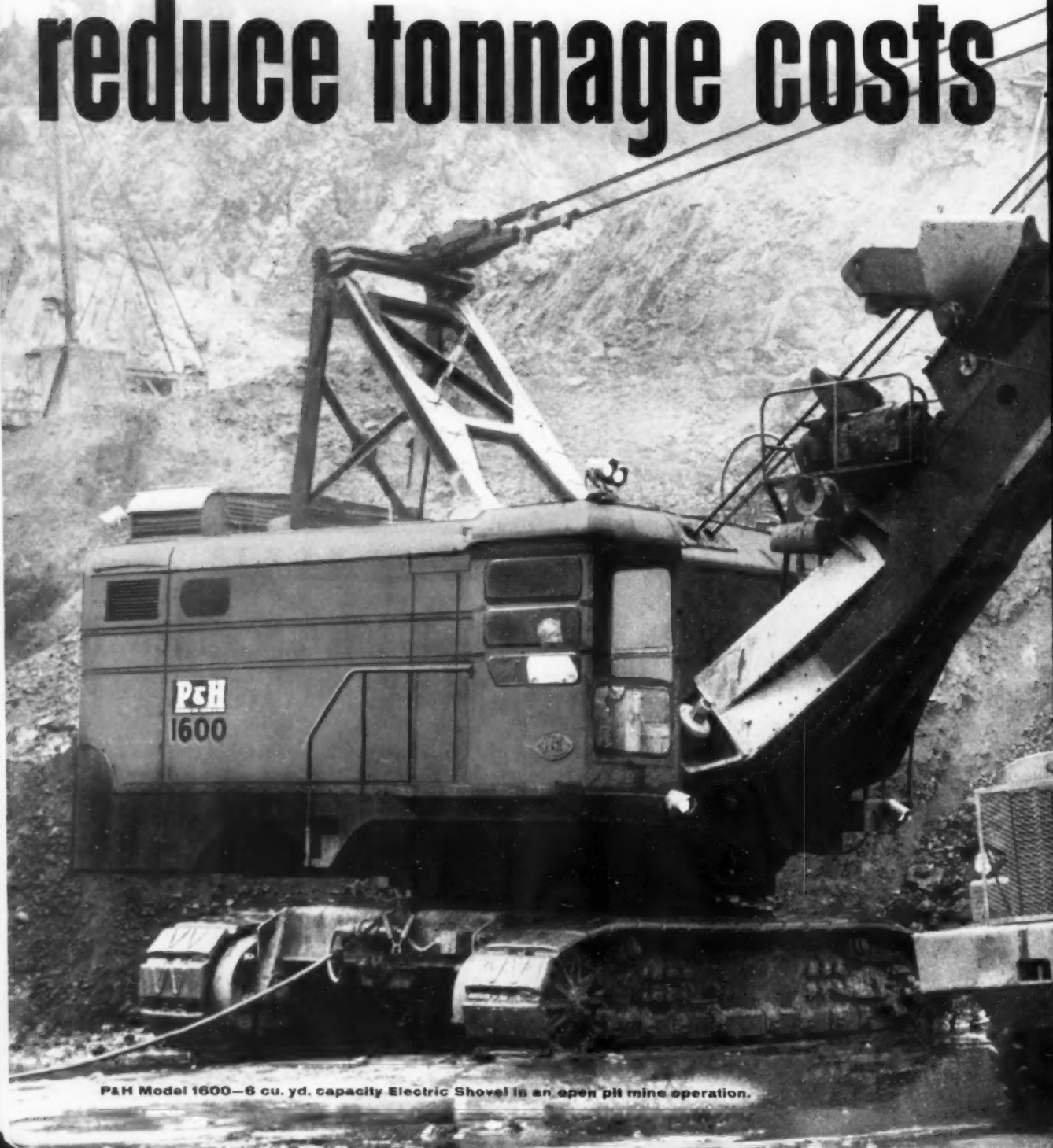
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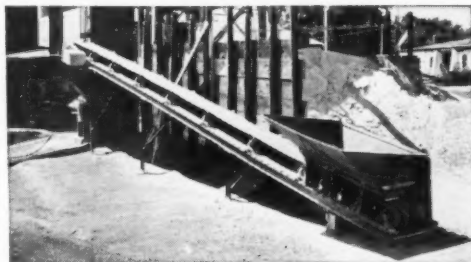
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CATALOGUE, SURVEY & DIRECTORY NUMBER, 1958

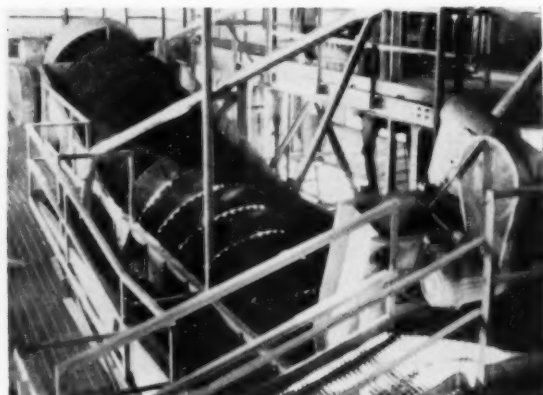


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The Akins Classifier was originally developed, in 1908, for use in closed circuit with a ball mill. Its outstanding success led to many other profitable applications where it has demonstrated its superiority... dewatering and recovering fine solids; sand and slime separations; washing coal, sand, and oyster shell; desliming and de-oiling phosphate

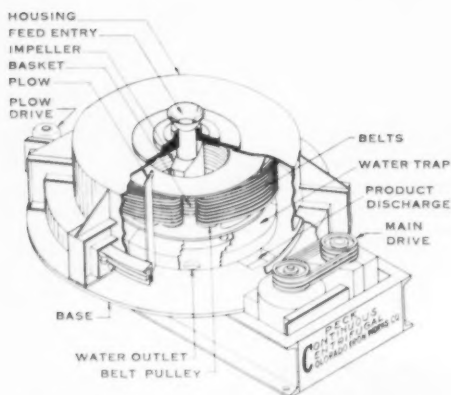


rock and concentrate; sink-float concentration; and many others. The Akins is made in sizes up to 84", simplex and duplex, in two types—small and large settling pool. The Akins Heavy-Media Separator is the only unit available which can make a 3-product separation in one machine from one medium cleanup circuit.

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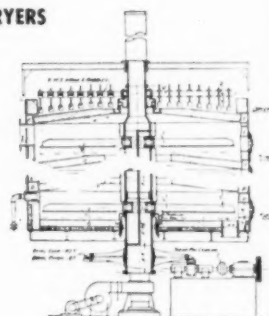
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- Fine COAL
- Crystalline CHEMICAL products
- Non-metallic and metallic MINERAL CONCENTRATES



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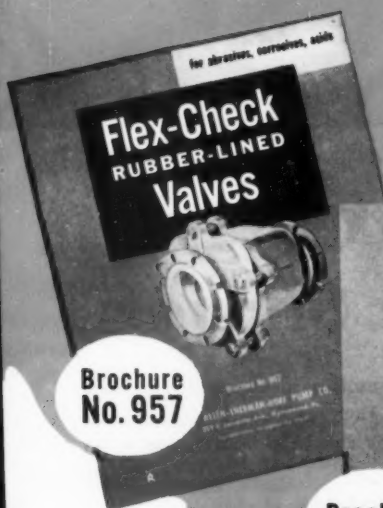
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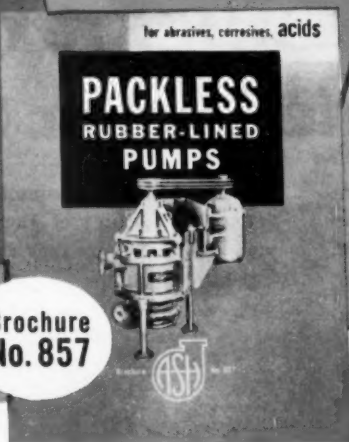
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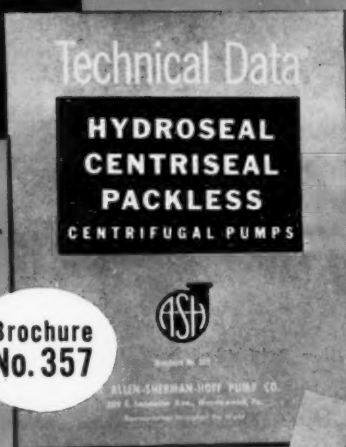
Gives easier way to select the
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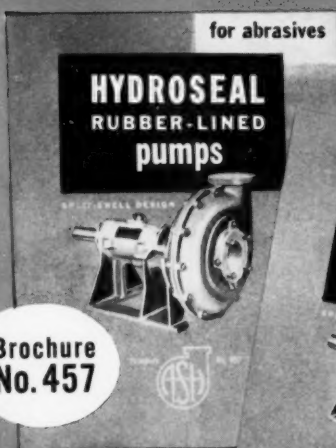
**Brochure
No. 957**



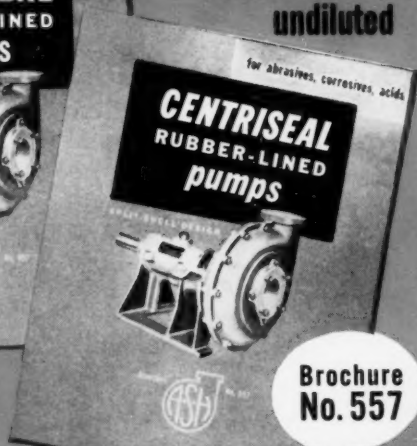
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**Brochure
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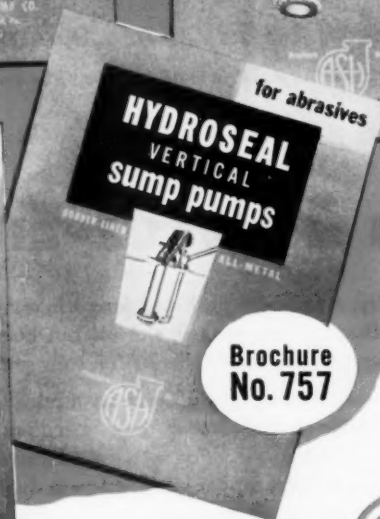
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With the 16-page Technical Data
book, one or more of these Bro-
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THE ALLEN-SHERMAN-HOFF PUMP CO.

Dept. J 259 E. Lancaster Ave., Wynnwood, Pa.

Representatives throughout the World



HYDROSEAL and CENTRISEAL
SAND, SLURRY & DREDGE PUMPS

MAXIMIX RUBBER PROTECTED



This Bucyrus-Erie 150-B is loading iron ore into end-dump trucks in a pit on the Mesabi Range.

CUT THE COSTS YOU CAN CONTROL with Bucyrus-Erie Electric Shovels

The big capacity, rugged strength and long-life service built into Bucyrus-Erie electric shovels can help hold down digging and loading costs in your pit.

Years of service in every type of mine have proved the outstanding design features of these machines. Their sturdy front-end construction — with exclusive two-section boom, tubular dipper stick and twin dual hoist — provides plenty of strength, reduces dead-weight, enables these shovels to handle big yardages economically. Bucyrus-Erie-improved Ward Leonard electric control provides fast acceleration and deceleration, extra torque and responsive power to speed work cycles. Strength and durability throughout assures efficient performance for profitable operations over a long period.

Let us give you complete information on these and other features of Bucyrus-Erie electric shovels and show you how they can help you control costs in your pit.

147157C



A Familiar Sign...  ...at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

MINING WORLD



**A
TANK CAR
AN HOUR
OF
H₂SO₄**



This FluoSolids System at West Rand Consolidated Gold Mines, Ltd. on South Africa's fabulous Witwatersrand was started up early in 1952. The first of several to go into operation on the Rand, it was also the first in the world to combine FluoSolids roasting of pyrite with a contact acid plant.

Over 1650 tons of H₂SO₄ — enough to fill twenty-four tank cars — are being produced every day for uranium leaching at seven South African mills.

An important part of each of these installations is a Dorco FluoSolids System. Cumulatively the Systems include nineteen Reactors, of which sixteen were on original order and three on repeat orders, plus additional Dorr-Oliver and auxiliary equipment to produce a high strength SO₂ gas for acid manufacture by conventional contact acid plants.

Total feed to the Systems is 1450 tons per day of pyritic gold mill tailings — averaging 35 to 45%

total sulfur, gas production is 75,000 to 82,000 SCFM. Gas strength averages 12 to 13% SO₂ . . . sulfur recovery approximately 90%.

The efficiency and economics of the Dorco FluoSolids System is in evidence in these facts. Additional representative proof that the FluoSolids process can produce an SO₂ gas at lower investment and operating costs than other roasters.

If there's a step in your flowsheet where intimate contact between solids and gases is essential, fluidization should be investigated. Just drop a line to Dorr-Oliver Incorporated, Stamford, Connecticut.

FluoSolids is a Trade Mark of Dorr-Oliver Incorporated, Reg. U. S. Pat. Off.



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WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U. S. A.

Now for air legs! a removable bit that's one-piece strong!



Here is a removable bit for air-leg drills that has the strength of one-piece steels. It's the new Timken® tapered socket bit. The tapered union gives you all the advantages of removability and a strong secure union for use with air-legs.

Because the new Timken tapered bit is removable, you get all these advantages that intraset steels can't provide:

You don't have to throw away the drill steel just because the carbides wear out. You do with intrasets.

You carry a few bits down into the mine instead of a load of steel. You can't with intrasets.

You can quickly change bit gauge sizes using the same steel. You can't do this with intrasets.

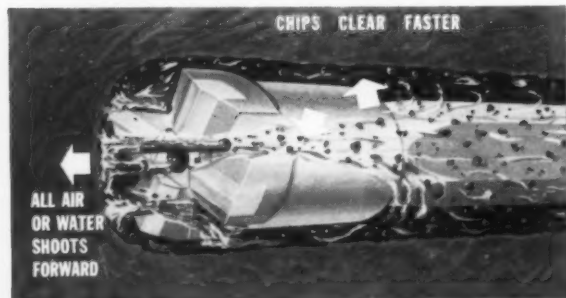
You don't have to lug the whole steel back just to

resharpen the cutting edges. You do with intrasets.

You get four carbide cutting edges. You get only two with chisel intrasets.

And the new frontal design of the Timken tapered bit gives you faster chip clearance because 1) new five front holes shoot water or air directly against the rock face and 2) new deeper, wider wing clearance lets chips wash back faster. New special-analysis carbide inserts give superior wear-resistance with added shock-resistance, can be reconditioned many times.

For removability *and* strength, use the air-leg bit of the future. Write for our free brochure. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO".



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

AVAILABLE NOW...
THE AIR-LEG BIT OF THE FUTURE



Lima Type 2400 Dragline equipped with 135-ft. boom and torque converter at work on coal stripping operation near Nesquehoning, Pa. Machine is one of the 15 Limas owned and operated by Fauzio Brothers.

"Nothing beats a LIMA for 'round the clock dependability" (Pat Fauzio Fauzio Bros.)

As one of the major stripping contractors in the hard coal region, Fauzio Brothers, Nesquehoning, Pa., count heavily on the ruggedness of their equipment. Day and night their Limas are on the job.

Pat Fauzio says: "We bought our first Lima shovel back in 1937. It did so well that we have purchased 20 Lima machines since, and have 15 working for us at the present time. I'm glad to report that the original Lima is still producing—a real tribute to its engineering and construction. Not only have these machines stood up to a lot of hard work, but they have been run by many different operators

over the years—a real test of ruggedness. In our experience, nothing beats a Lima for 'round the clock dependability.

"One of the prime reasons for our purchase of Limas is the people back of the equipment—the men at Lima and at our distributor's. They always have given us excellent service on short notice."

There's a type and size of Lima that can speed your stripping and loading operations for greater profit. It will pay you to get the complete details from your nearby Lima distributor. Or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

Cable Address: LIMASHOVEL, Lima, Ohio, U.S.A.

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment

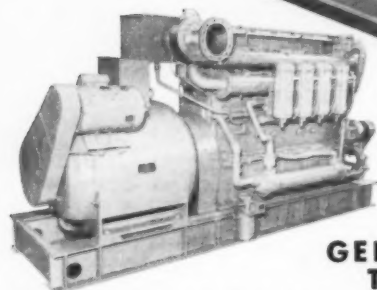
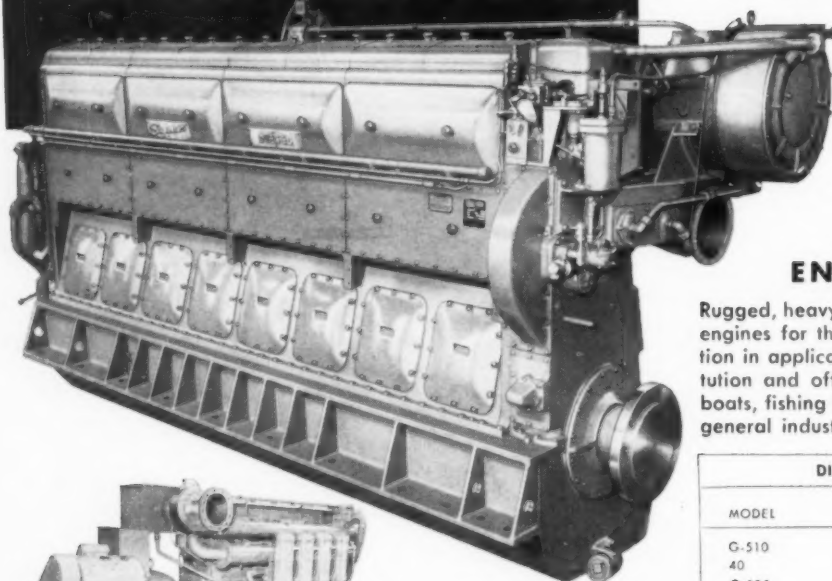


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White SUPERIOR and ATLAS ENGINES

DIESEL • DUAL FUEL • GAS 100 to 2150 H.P.

for INDUSTRIAL, MARINE and OIL FIELD SERVICE



GENERATOR SETS TO 1500 KW

Standard or custom-built electric generator sets for your application. Diesel, dual fuel or gas engines. 150 to 1500 KW.

STANDARD A.C. GENERATOR SETS • DIESEL or DUAL FUEL ENGINES

MODEL	RPM	BHP	KW	ENGINE HEIGHT	APPROXIMATE ENGINE WIDTH	DIMENSIONS ENGINE & GENERATOR LENGTH
40-S-6	600	225	150	69 1/4"	47 3/4"	171 3/4"
40-S-6	720	290	200	69 1/4"	47 3/4"	171 3/4"
40-S-6	900	360	250	69 1/4"	47 3/4"	171 3/4"
40-SX-6	900	430	300	71 1/2"	47 3/4"	174 3/4"
40-SX-6	900	505	350	71 1/2"	47 3/4"	177 3/4"

STANDARD A.C. GENERATOR SETS • NATURAL GAS ENGINES

6G-510	720	225	150	65 1/4"	45 1/4"	149 1/2"
6G-510	900	325	200	65 1/4"	45 1/4"	155"
6G-825	720	375	250	70"	61"	171 3/4"
6G-825	900	450	300	70"	61"	171 3/4"

Standard generator voltage may be 120/208, 127/220, 240, 480 or 600. Custom-built sets 150 to 1500 KW.

ENGINE POWER UNITS

Rugged, heavy-duty, high-quality, 6 and 8 cylinder, 4-cycle engines for the most dependable and economical operation in applications such as: municipal, public utility, institution and office building power plants; oil fields, work boats, fishing boats, dredges, quarries, power shovels and general industrial service.

DIESEL, DUAL FUEL and GAS ENGINES

MODEL	FUEL	CONTINUOUS H.P. RANGE	CONTINUOUS R.P.M. RANGE
G-510	G	190-400	600-1200
40	D, DF	215-1025	600-1100
G-825	G	300-705	600-900
60	D, DF	410-1325	400-514
65	D, DF	580-2150	500-600
80	D, DF, G	600-2000	300-375

D—Diesel; DF—Dual Fuel; G—Gas



MOBILE ELECTRIC GENERATING PLANTS

Completely self-contained powerhouse on wheels. 350 KW, 500 KW, 1000 KW and 1250 KW for base power, emergency or supplementary power wherever needed.

CALL, WIRE OR WRITE FOR COMPLETE INFORMATION



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Plant and General Offices: 1403 Sheridan, Springfield 99, Ohio
Phone: FAIRFAX 3-4921

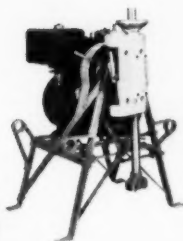
EXPORT OFFICES: 415 Madison Avenue, New York 17, N. Y. Cable: Superdiesel



BBS-1

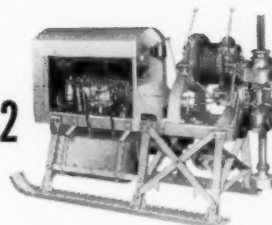
World's best known
surface drill. Handles "E"
Rods to 1,500 ft.,
"A" to 1,100 ft.

x-ray



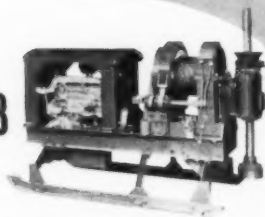
Compact, portable—
185 lbs. net. Takes $\frac{3}{4}$ " or
 $\frac{7}{8}$ " core to 200 ft. Low
fuel consumption.

BBS-2



Versatile, choice of 5
swivelheads. Depths to 3,500 ft.
Gas or diesel.

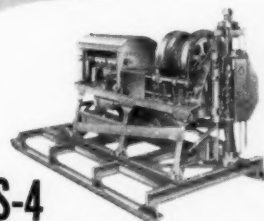
BBS-3



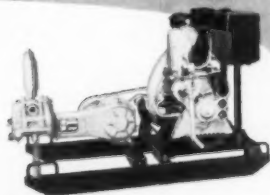
Strong, speedy unit for
deep drilling . . . 4,600 ft.
with "A" or "B"
Rods, 95 h.p. diesel.

if it's for
diamond
drilling
we make it!

BBS-4



Drills to 5,000 ft.
with "B" Rods. Moves
under own power, gas or
diesel.



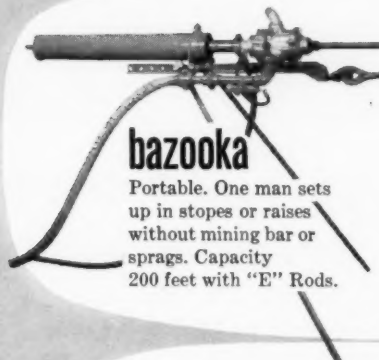
drill pumps

5-12 and 4-7 models.
Capacities 400 to 1,200 g.p.h.
Diesel motor optional.



permaset bits

(Powdered metal)
All standard sizes
available from stock.
Also reaming shells,
etc.

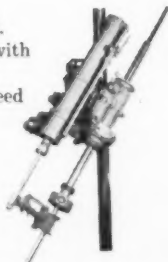


bazooka

Portable. One man sets
up in stopes or raises
without mining bar or
sprags. Capacity
200 feet with "E" Rods.

JV

4 feed swivelhead.
Capacity 800 ft. with
"E" Rods. JVR
with right-hand feed
screw for
blastholes.



BBU-2

Rugged. Capacity
1,800 ft. with
"E" Rods, 1,400 ft.
with "A", four
gear speeds.



VEG

Vane motored version
of J.V. Lightweight,
compact construction.
Can be speedily
dismantled into
two units.



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Roof Bolting at the Face Minimizes Danger of Rock Falls

When you install Bethlehem Pacific headed or slotted roof bolts at the face, using a predetermined pattern, the mine roof becomes safer, less likely to fall. The roof bolts lock themselves in drilled holes, anchoring the strata into a thick, self-supporting beam.

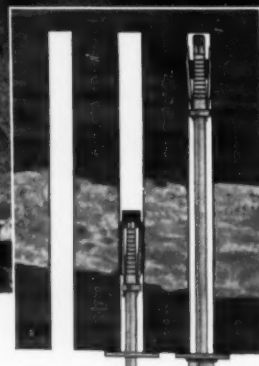
With such a roof bolting installation, wider openings and clearances are possible. And because there are no bulky supports, mechanized equipment can be maneuvered easily, even right up to the face. Besides, there's no fire hazard involved.

Bethlehem Pacific headed roof bolts are furnished in three types:

1. $\frac{3}{4}$ -in. high-strength; typical breaking load 34,000 lb.
2. $\frac{5}{8}$ -in. high-strength; typical breaking load 24,000 lb.
3. $\frac{7}{8}$ -in. high-strength; typical breaking load 45,000 lb.

Bethlehem Pacific slotted roof bolts are of 1-in. diam; typical breaking load 45,000 lb.

We would be happy to give you further information about Bethlehem Pacific mine roof bolts. Just contact our nearest sales office.



HOW TO INSTALL
HEADED ROOF BOLTS

Assembly, consisting of square-head bolt, square roof plate, malleable-iron shell and steel plug, is inserted in drilled hole.

Bolt is tightened, drawing down plug, and expanding leaves of shell.

Roof plate provides additional support. Steel tie may be used instead.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: Phoenix, Los Angeles, San Francisco,
Spokane, Seattle, Portland

BETHLEHEM PACIFIC





*High altitudes, narrow work areas severely test this Michigan, yet every day it loads **400 tons** of rock weighing **5,400 lbs per yd.***

High in the Rocky Mountains of Montana, U.S.A., Cummings-Roberts Company has one of the toughest rock-loading jobs you could find anywhere.

Part of the time, they blast and load mountain-top granite . . . summer and early fall, they load fluorspar. As you know, the granite overburden alone would severely test *any* loader. Fluorspar, however, is even worse. A heavy rock mineral, it weighs 5,400 pounds per cubic yard—over 850 lbs more per yard than in-bank granite (and 2,200 lbs more than pit-run gravel).

Increases efficiency

Over the years, Cummings-Roberts has tried just about every kind of loader made. Last year to increase efficiency, their Michigan Distributor suggested a Model 175A Michigan Tractor Shovel. "Frankly," Cummings-Roberts officials told them, "we don't believe *any* rubber-tired unit can load the material efficiently. But we'll give it a try."

Result? John Taber, General Superintendent, wouldn't let them take the Michigan off the job.

Today, the 133 hp 2¾ yard Michigan handles *all* loading of the super-heavy fluorspar. Production, with trucks on 600

ft one-way hauls to crushing mill, averages 400 tons per 7-hour day. Production of the granite overburden, with trucks on 2,000 ft one-way hauls, averages 500 tons per day

Downtime negligible

With all this rugged loading of super-heavy material, plus repeated back-and-forth maneuvering on narrow benches, plus continuous work at high 7,000 ft altitudes, the torque converter equipped Michigan has posted an excellent mechanical record. *To date, it has had only one minor breakdown!*

Also tows compressors, speeds other odd jobs

Operator Don Lindblom likes Michigan's ease of operation, says it takes

only half-an-hour per day to refuel and lubricate. Foreman Waino Lindblom adds, "We particularly like Michigan's truck-like speed in moving from level to level." This mobility gives the Michigan some "spare time" to handle maintenance jobs scattered along 15 miles of mountain roads—cleaning rock off benches so trucks and wagon drills can get through . . . hauling air compressors . . . digging culverts . . . even plowing snow.

If your job involves similar scattered maintenance, or similar loading of heavy materials, or similar tough working conditions, you too may be able to improve efficiency with a Michigan Tractor Shovel. To prove it, your Michigan Distributor will be glad to show you a Michigan Tractor Shovel in action. Phone him or write us for details.

Michigan is a registered trademark of

CLARK EQUIPMENT COMPANY

CLARK[®]
EQUIPMENT

Construction Machinery Division

2493 Pipestone Road, Benton Harbor, Michigan

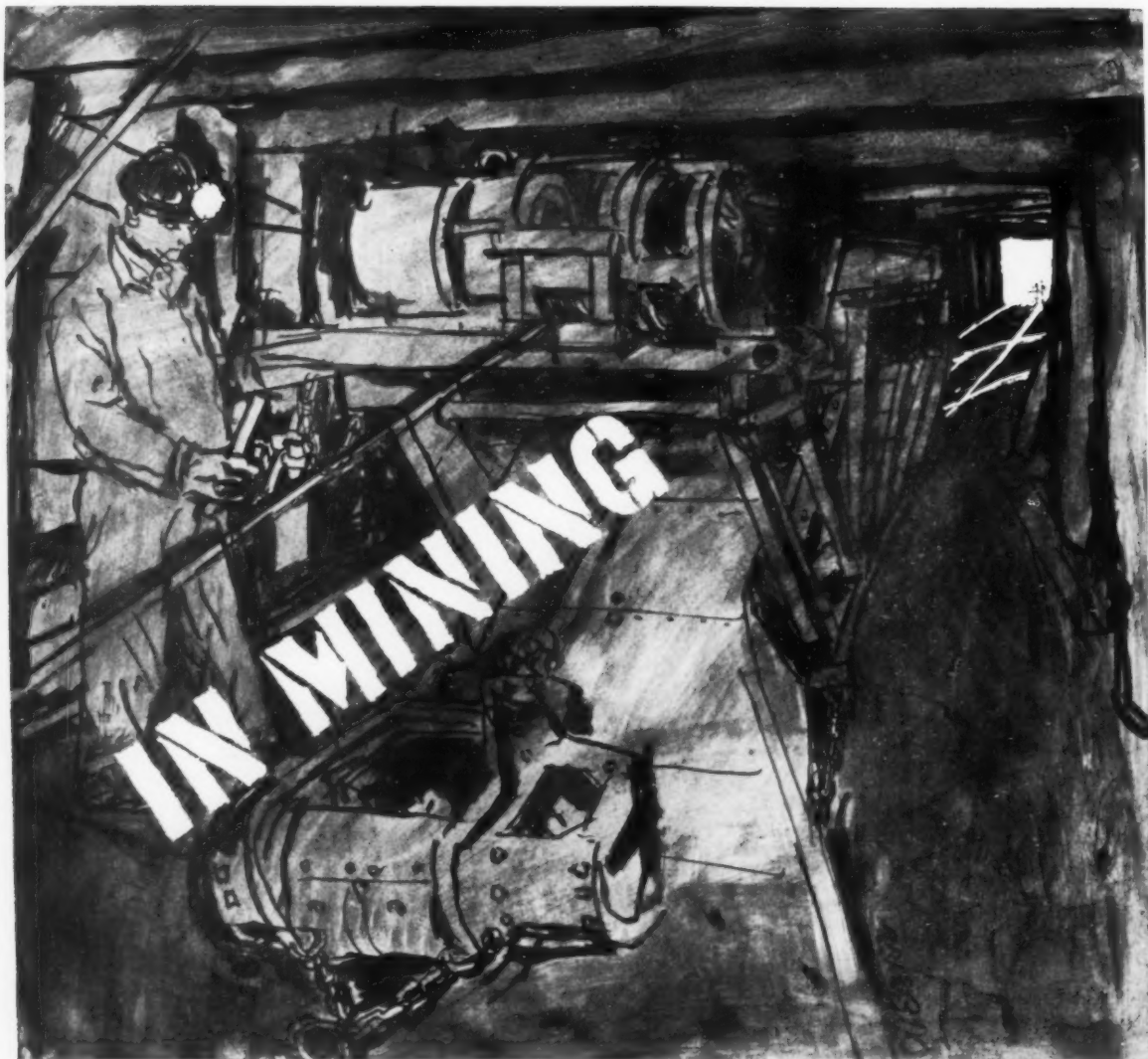
In Canada: Canadian

Clark, Ltd.

St. Thomas,

Ontario





NOTHING TRANSMITS POWER WITH THE FLEXIBILITY OF ROEBLING ROYAL BLUE WIRE ROPE. This, and its exceptional resistance to abrasion, shock and corrosion attack, make Royal Blue the strongest and safest wire rope you've ever used. On any comparative cost basis, nothing matches it as an instrument for transmitting power. For details on the real meaning of long service life, contact your nearby Roebling Distributor, or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.



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for Mines, Pits and Quarries

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Other McLanahan Equipment Not Illustrated

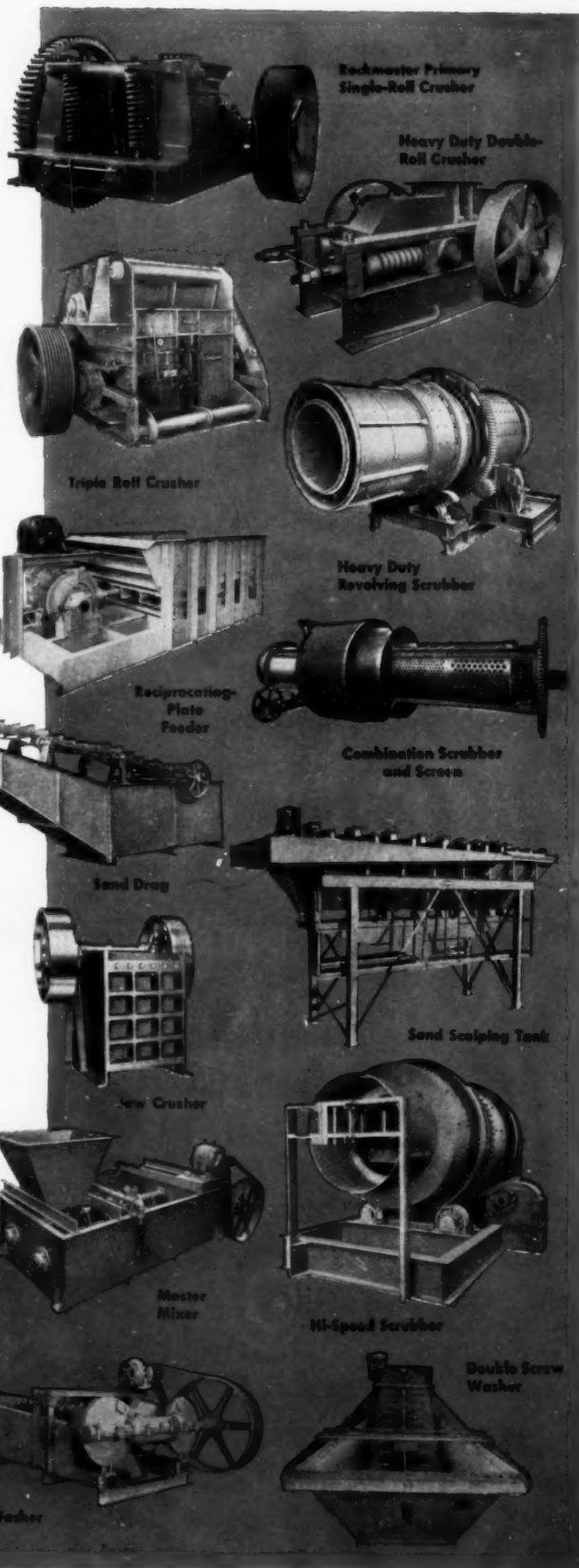
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"Modern Copper Concentrator at Silver Bell, Ariz., for American Smelting & Refining Company"

FROM START TO START-UP

Planning for successful operation begins with preliminary designs and cost estimates. From start to production, assign Stearns-Roger the task—one order, one responsibility for design, engineering, procurement and construction. For new plant or modification,

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THE STEARNS-ROGER MFG. CO. • DENVER, COLORADO

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27ton

"EUC" REAR-DUMP

*It's new...but
JOB PROVED!*



325 or 335 h.p. . . Torqmatic Drive . . . 18.00 x 25 tires

Model R-27 is a new size in the complete line of Euclid Rear-Dumps—rated payload is 54,000 lbs. This off-highway hauler incorporates the job-proved components which have made Euclid Rear-Dumps the outstanding choice of contractors, mines and quarries.

With either 325 h.p. GM diesel or 335 Cummins engine, Allison Torqmatic Drive makes maximum use of the power for faster hauling cycles. Converter lock-up in the 4-speed Torqmatic permits 34 mph speed with full payload and efficient performance on long, high speed hauls.

Standard 18.00 x 25 tires on all four wheels assure the traction and load carrying capacity needed for moving 27-ton payloads on tough hauls. Standard body is rated at 18 cu. yds. struck—quarry type body is also available. The R-27 is equipped with oil retarder for safer, more economical braking on jobs with steep down-grades on the loaded haul.

See your Euclid dealer for detailed specifications on this new 27-ton Rear-Dump . . . it's a good example of the advanced design that makes Euclid your best equipment investment.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

***A complete line of Rear-Dumps—10, 15, 18, 22, 27, 40 and 50 ton capacities,
also semi-trailer models of 12, 22 and 35 ton payload—to fit any job.***



GENERAL MOTORS OVERSEAS OPERATIONS • 1775 Broadway, New York 19, N. Y., U. S. A.

EUCLID (GREAT BRITAIN) LIMITED • Newhouse, Lanarkshire, Scotland

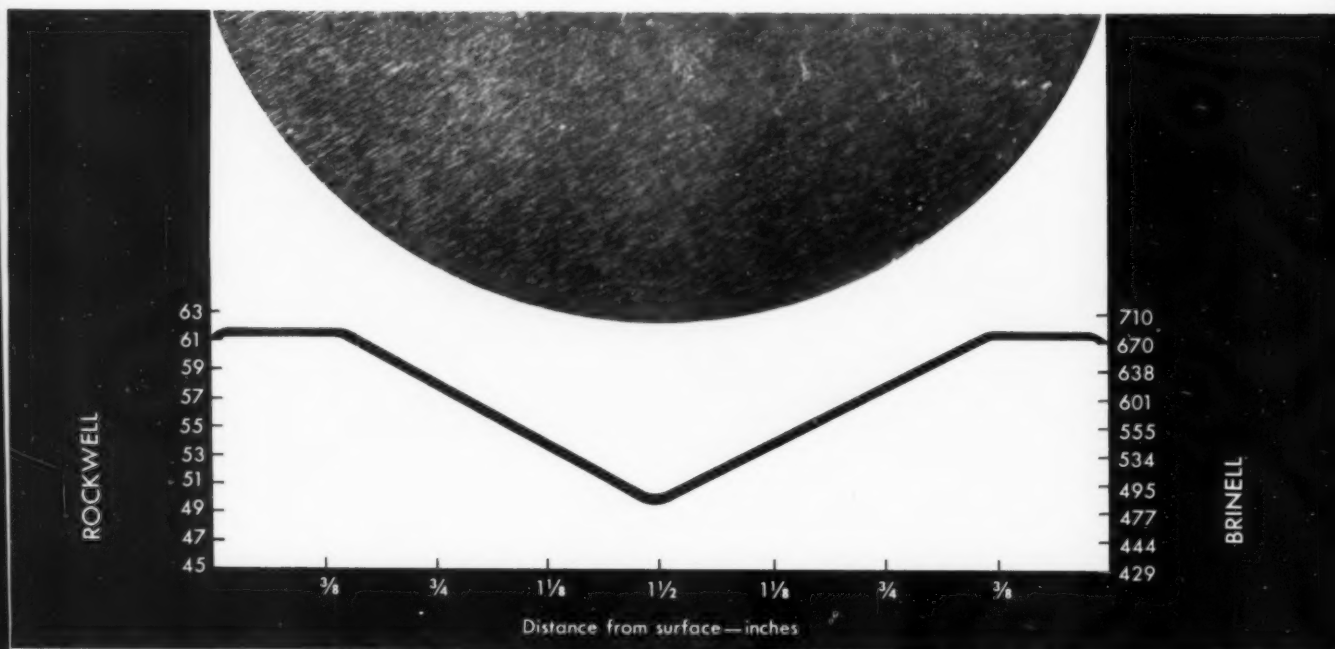
EUCLID PRODUCTS



controlled metal hardness means
heat-treated cast alloy steel

NACO GRINDING BALLS

cut per-ton grinding costs



Note how new casting process and full heat treatment show controlled hardness between surface and inner core.

Spectrographic analytical control of elements in steel making processes and controlled heat treatment assure the desired metallurgical grain structure which produce the type of hardness required for maximum wearing qualities.

Performance reports on Naco solid cast alloy steel grinding balls from mills now using them have been universally favorable—both in lasting qualities and impact absorption.

Structurally, they possess a grain

closely approaching tool steel—tough, hard and rugged for long lasting qualities. Laboratory tests show a remarkable uniformity in solidity, both under X-ray and specific gravity tests, with controlled hardness holding to a desired depth.

AA 5619



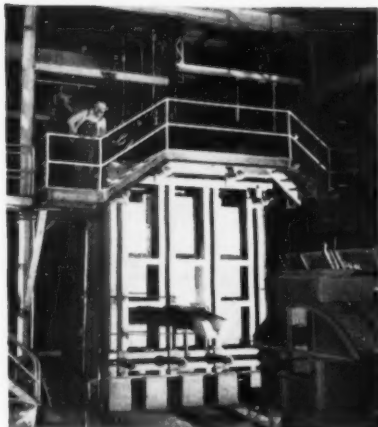
CAPITOL FOUNDRY DIVISION

NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

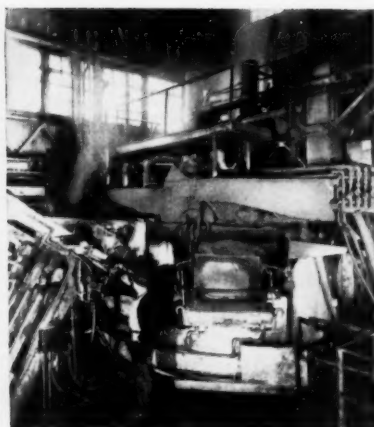
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GENERAL OFFICES • CLEVELAND 6, OHIO

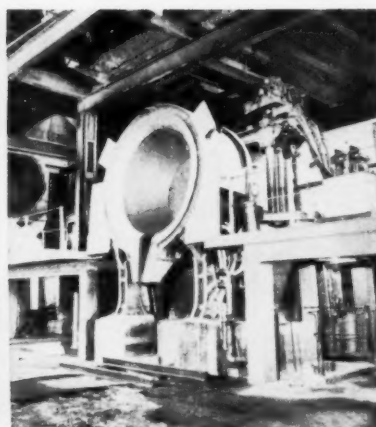
Established 1868



Matte and Speiss Smelting



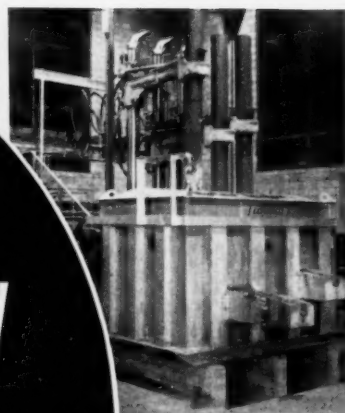
Copper Melting



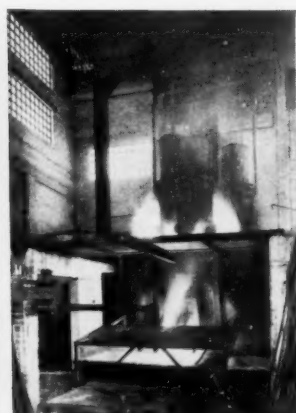
On Low Carbon Ferro-Alloys

Lectromelt* Furnaces really get around—

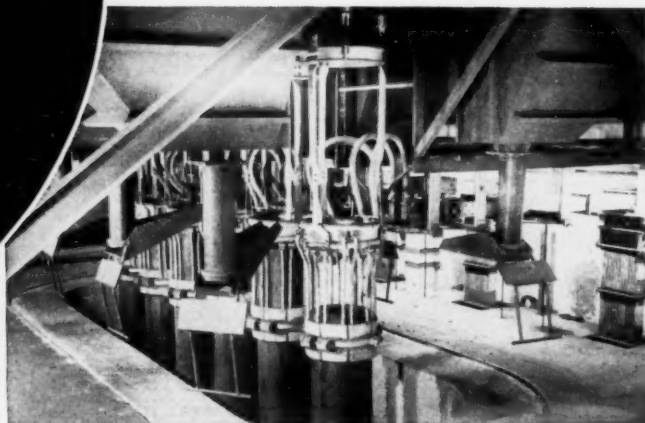
Catalog No. 105 describes furnaces for Smelting and Refining. For a copy, write Lectromelt Furnace Division, McGraw-Edison Company, 324 32nd Street, Pittsburgh 30, Pennsylvania.



Pilot Plant Research



Ferro-Alloy Smelting



"Six-in-line" Smelter

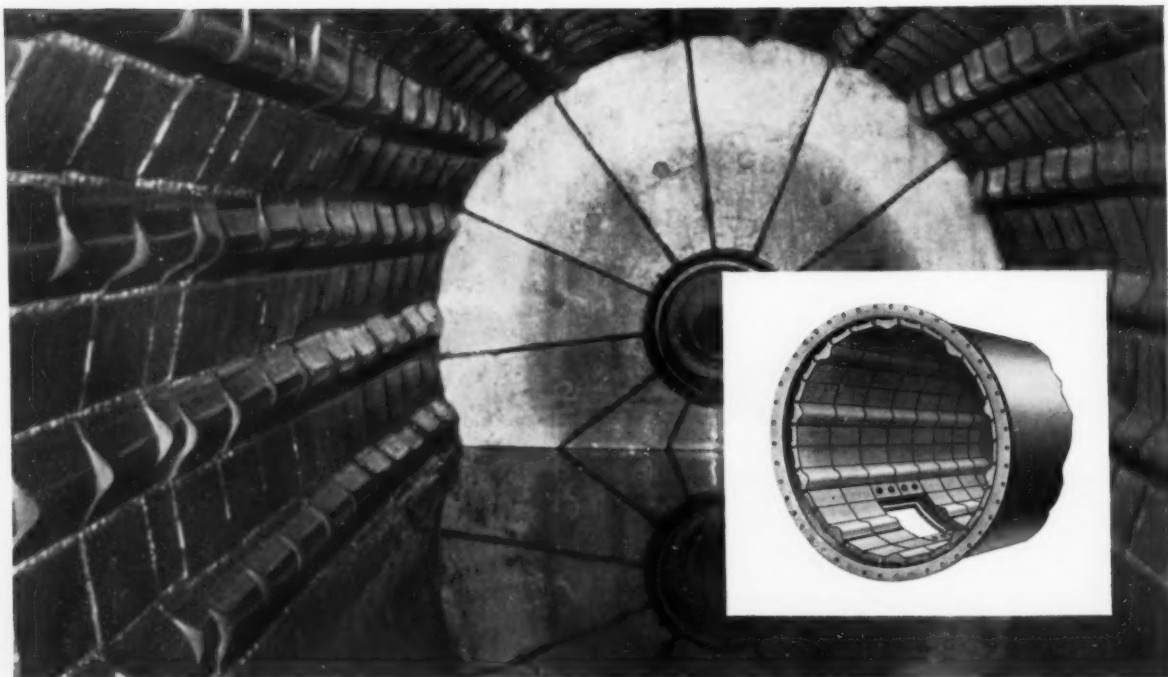


* Reg. Trademark U.S. Pat. Off.

LECTROMELT FURNACE DIVISION

McGraw-Edison Company

Pittsburgh 30, Pennsylvania



8

Reasons Why You Should Standardize with B&W Universal Liner Plates

Better Performance with Lower Costs— Same Casting Fits All Mill Sizes

B&W Tube Mill Liners reduce capital, time and labor costs. Consequently, they reduce the cost of the material ground. Here are eight reasons why:

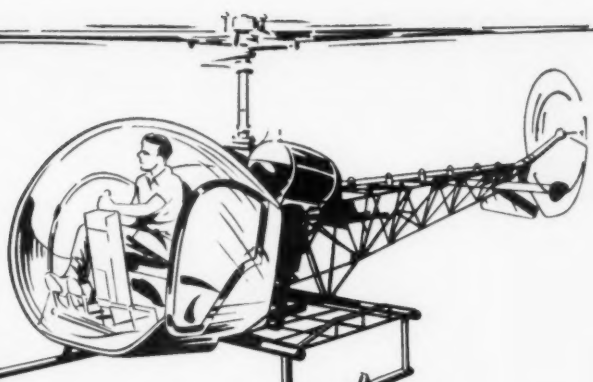
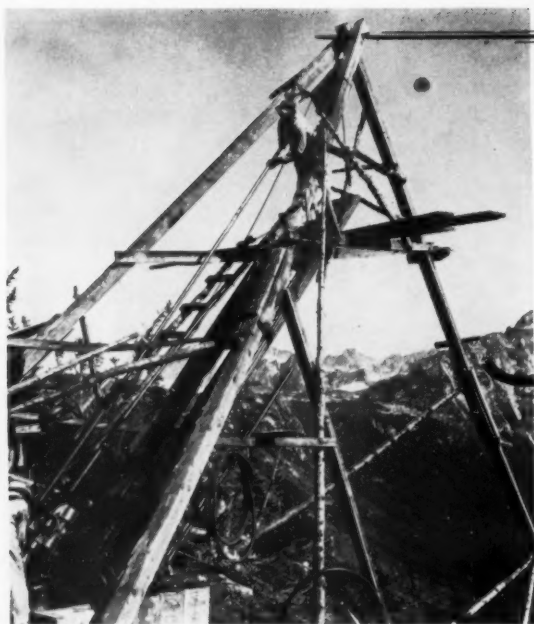
1. Lower Initial Costs—standardization eliminates chiller and pattern costs.
2. Longer Life For Liners—better quality control on a mass production casting, utilizing permanent molds, results in uniform wear. Ideal size for uniform chill and heat-treatment.
3. Longer Life for Different Applications—this is assured by selection of proper materials. Design is suitable for either chilled irons or wear steels.
4. Reduced Costs in Both Direct Labor and Outage—installation time is less because small size and weight of castings allows them to be handled easily, without cranes and with less fatigue for workers.
5. Reduces Costs in Storage Space—because small castings stack easily, little storage space is required. One design of casting interchangeable for all size mills also simplifies records.
6. Reduced Costs in Liner Inventory—standardization is possible because one design fits all diameters of mills. Standardization means quicker unloading and storage.
7. Reduced Costs on Breakage Claims and Delays for Replacements—small castings are rugged and almost impossible to break by handling. Large castings of hard, brittle irons sometimes break in shipment.
8. Reduced Costs in Determining Most Efficient Wear Patterns—you can get wear profiles consisting of all lifter ribs or all flats from the same castings, as well as a combination of both including straight or spiralled lifter pattern.

Liners are supplied in two nominal thicknesses, 1½" and 3" with 1½" high lifters. Castings are 6" wide x 12" long. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. For additional information on B&W Universal Tube Mill Liner Plates write The Babcock & Wilcox Company, Process Equipment, Barberton, Ohio.

5-471

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& WILCOX**





CORES *via* COPTER

Boyles modern exploratory drilling eliminates time and cost of packing-in to inaccessible areas.

Boyles Bros. Drilling Co. has adapted tools and machines to a helicopter operation that gets drilling jobs set up in almost inaccessible areas in a fraction of the time required by conventional land operations. Illustrated is a drilling job, in a primitive area of the Pacific Northwest, that would have required three weeks to pack-in the necessary equipment. The crew and all the supplies, except timbers secured at the site, were transported to the job in record time by helicopter.

Since 1895 Boyles Bros. Drilling Co. has applied its engineering skill and fine equipment to the task of completing jobs as per agreement.

Write or call your nearest Boyles Bros. office for complete details on:
EXPLORATION and DEVELOPMENT
CORE DRILLING, SURFACE and UNDERGROUND
ROCK BREAKING — GROUTING
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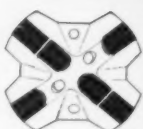
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Contact Salt Lake City Office



Available in sizes up to 5". Note how location of carbide inserts in bit body has eliminated the need for a troublesome center spacer.



Kennametal PX
Rock Bit

HARD DRILLING? The easy way saves you money

KENNAMETAL* PX Rock Bits take you farther . . . faster

Kennametal's "X" design, with carbide inserts of alternately long and short lengths, eliminates rifling, provides greater clearance for large chips, permits two off-center, non-clog water ports.

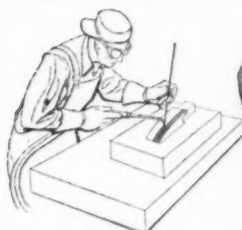
TYPICAL PERFORMANCES

PX-600-3½ and PC-600-3 drilled 150 ft. per regrind (8-10 regrinds per bit) in abrasive Pocono sandstone at speeds of 12" to 14" per minute. PXX-3½ drilled more than 1,000 ft. per bit of hard diabase rock.

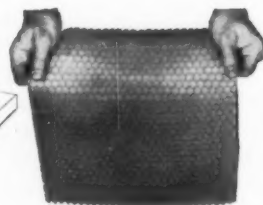
On-the-job records such as this require carbide of the highest quality . . . such as the grades developed at Kennametal's own refinery plants especially for mining, quarrying and construction.

Switch to the easy way. Let your Kennametal Representative help you select and actually test the Kennametal Bit style and carbide grade designed to best match your operating conditions. You'll find his name listed in the Classified Section of your Telephone Directory under "Mining." Or, write KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

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KENFACE



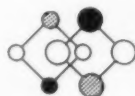
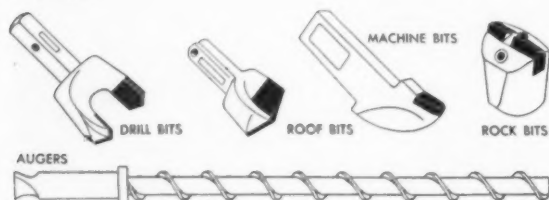
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Kennametal now offers hard-facing materials based on the same highest quality carbide used in Kennametal Mining Tools.

KENFACE*—Cemented carbide in tubes for oxy-acetylene application. More resistant to abrasive wear than any other tube or rod hard-facing.

KENPLATE*—Solid hexagonal pieces of cemented carbide provide the ultimate in abrasion resistance. Supplied on flexible backing sheets that are easily cut to fit your work piece.

3137



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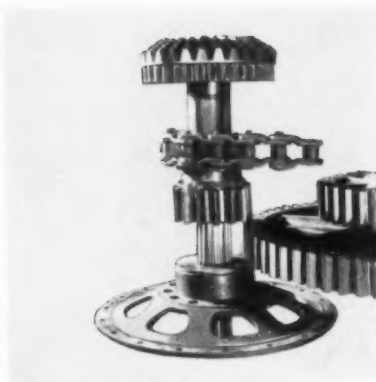
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SOLID STABILITY

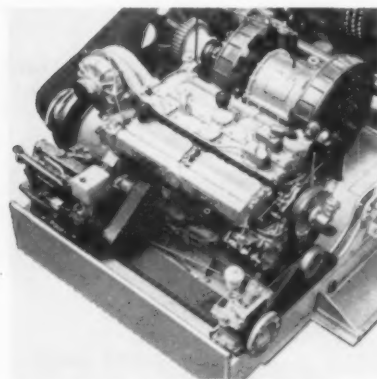
Look at this massive carbody and these long, wide crawlers! A solid base and a low ground bearing pressure of only 9.6 lbs. per sq. inch let you work right at the edge of a bank.

a quick guide to **increased** mining output with the **Manitowoc 4500**



DIRECT POWER FLOW

No one but Manitowoc gives you a slide pinion design that directs power straight to the "business end". Only gears that are working turn and there are only 15 gears in the entire unit!



UNIFIED POWER PACKAGE

The 4500 is diesel engine powered with the capacity to tackle any job. There are no fussy electric motors . . . no dead-weight . . . no delicate circuits.



GREATER MOBILITY

Your operator travels steep grades without "babying" his machine . . . there's no rocking when moving. Lets you mine anywhere! And fast between job moves can be made by rail or highway trailer.



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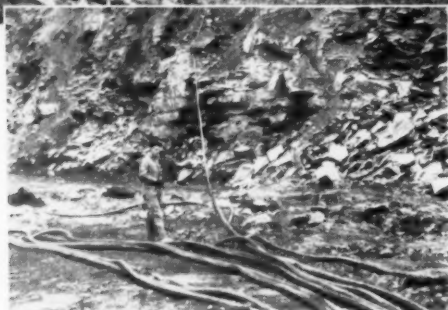
A 60' Hi-Lift shovel boom and a 45' stick are available to give extra reach and height. Standard 120' dragline boom handles 6-yd. bucket . . . special 140' boom and 4-yd. bucket extends digging range.

MANITOWOC 4500

5½-Yd. Shovel - 6-Yd. Dragline



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KEEPS THIS 2900-TON SHOVEL ON THE JOB

Simco-Peabody Coal Company's mammoth Marion Type 5760 shovel, shown in operation at Coshocton, Ohio, proves once again that General Cable's Super Service Portable Power and Mining Cable can really take it under severe operating conditions. All Super Service cables have an extra-heavy-duty, mold-vulcanized *Supertuf* neoprene sheath that offers unequalled resistance to mechanical abuse, weathering, flame, oils, acids, and alkalis.

Cable that can stand up to this sort of treatment is a necessity wherever service interruptions can be costly. There's a complete line of General Cable portable power cables from 600V to 15KV, all constructed to keep your equipment on the job when the going is tough. Contact the General Cable Specialist at your nearest General Cable Sales Office and Distributing Center for complete information.

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Tough... fire-resistant... long-wearing, Thermocoal conveyor belting is used by profit-minded mine operators everywhere.

Here's belting that bears acceptance designation # 28-13 of the U. S. Bureau of Mines... meets or exceeds all after-flame and after-glow tests. It's rugged belting, with high resistance to flexing and impact, edge wear, abrasion and mildew.

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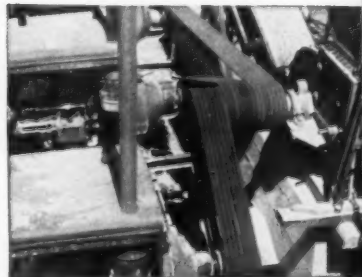
Order Thermocoal Belting through your Thermoid distributor, or write direct for detailed information and data sheets.



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acceptance designation # 28-13.*

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Thermoid Multi V-Belts...**



... and Thermoid Hose



ENGINEER'S FIELD REPORT

PRODUCT **CHEVRON VISTAC OIL**

**NEVADA-MASSACHUSETTS
COMPANY**

FIRM **Tungsten, Nevada**

Special Oil holds wear to minimum for 15 yrs.



Nevada-Massachusetts Co., operators of one of the world's largest tungsten mines, has relied on Chevron Vistac Oil for 15 years, to keep their rock drills and other air tools operating at peak efficiency. "We use Vistac because it stays on the tools whether they're wet or dry. Doesn't create drag, either...we get full power with minimum tool wear," says general manager Eldridge Nash. Oil's tough, protective film resists high operating temperatures, helps this firm's rock drills (above) bore fifteen 2½-inch blasting holes averaging twelve feet in depth, in just eight hours. Nevada-Mass. does extensive underground mining at this site as well as surface operations.



TRADEMARKS "CHEVRON," "VISTAC" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

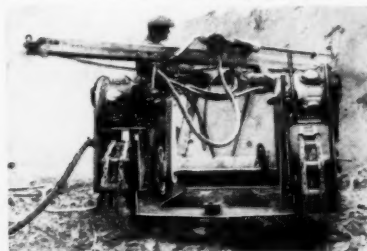
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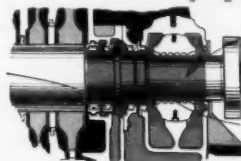


Despite heavy abrasive dust from drilling in Hornfels and Scheelite, (above), Chevron Vistac Oil keeps rock drills working smoothly. Lubricant is used in 60 rock drills, 3-wagon drills, plus 25 tuggers (air motors) on hoist equipment, loaders, slusher hoists and sump pumps.



Special wagon drill, built at mine, uses Ingersoll Rand DA 35 rock drill to bore horizontal holes up to 18 ft. deep. EIMCO air motors lubricated with Chevron Vistac Oil power tracks for fast and easy maneuvering.

Why Chevron Vistac Oil cuts costs in air-tool equipment



- Atomizes quickly and completely —carries evenly over all parts. Prevents excessive fogging and has no unpleasant odor.
- Additives help form tenacious, oily, pressure-resistant film in wet or dry conditions—cuts wear and power loss.
- Resists high temperatures and oxidation. Stays fluid at low temperatures.

For More Information on this or other petroleum products, or the name of your nearest distributor, write or call any company listed.



Accident! But Anaconda SH-D Shovel Cable kept on working in this open-pit mine. Good proof of Anaconda Cable's ability to take it.

CAVE-IN!

**But this unposed photo shows
Anaconda Shovel Cable still working!**

Above you see part of an actual cave-in. The Man from Anaconda was Johnny-on-the-spot with a camera, and the picture shows part of what he saw. The complete cave-in was much more extensive.

We use this photo to show how well Anaconda Shovel Cable stands up under abuse. Jagged rocks, sheer drops over cliffs, water-filled ditches—the Anaconda cable is built to endure all these hazards.

We're miners ourselves. All our practical experience—plus knowledge of what makes the best insulation and protective coverings—has gone into this cable.

Anaconda Shovel Cable has a strong, extra-tough—yet highly flexible—neoprene jacket. It resists abrasion, mechanical abuse, flame and water. Its long-lasting Anaconda Butyl Insulation has high dielectric strength, and outstanding resistance to ozone, heat and moisture.

It all adds up to a cable that's ready when the going's rough. For full information about this rugged shovel cable, contact the Man from Anaconda or your Anaconda distributor. Or write directly to: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

58017



SEE THE MAN FROM **ANACONDA**[®]
FOR **SHOVEL CABLE**

Get cost-tumbling 4-machine utility in NEW mining TD-6 or TD-9 4-in-1



U. S. Bureau of Mines APPROVALS No. 2409, 2410

The components of these new International Drott underground mining tractors were safety-tested and approved at the Bureau of Mines Laboratory, Pittsburgh, Pa.

Yes, now you can have the exclusive 4-In-1 with four-machine utility in two International Drott mining tractors: the new TD-6 with one cu yd capacity, and the 1½ cu yd TD-9.

Both versatile, big capacity rigs meet rigid U. S. Bureau of Mines safety standards for non-coal mining. Both feature the new short-coupled, stainless steel scrubber—that cools exhaust to a maximum of 160°F, while efficiently dissolving irritating aldehydes with water-bath turbulence.

The new design also provides blower fan action on the final exhaust which breaks up noxious gas concentrations to a ratio of 40 parts fresh air to one part exhaust.

In addition, low "trolley-clearing" profile, and "lean-over" features of these compact rigs provide unmatched, full-load "mine-tunnel" maneuverability.

Prove the tremendous cost-cutting, profit-producing advantages of getting big-capacity four-machine utility for one moderate investment—instantly, at the touch of a hydraulic machine-selector lever! See your International Drott Distributor for a demonstration of the new TD-6—or 1½ cu yd TD-9—mining tractor!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL DROTT

Ever wish you could pull a dozer "out of your hard-hat"...



to quickly shove material aside or pile it? Well, it's just that simple with an International Drott 4-in-1!

Ever wish you could have a clamshell by "a twist of the wrist"...



to have a bucket with "stand-and-fill" action to work under low ceilings and in close quarters? Well, it only takes a flip of the lever to start earning money with the 4-in-1's clamshell!

Ever wish you could take a "carry-type scraper" underground...



one that can strip, grade, or spread with inch-close accuracy—and can "skin-off" layered materials like nothing else on tracks? Well, you can! Famous 4-in-1 gives you this action, too!

Ever dream you could com- mand "rock-busting" Skid-Shovel action...



from a mobile, sure-treading crawler loader—and get three other machine actions, to boot? Well, you can in a 4-in-1—for Skid-Shovel action, with exclusive pry-action break-out, is integral in 4-in-1 design!



Gardner-Denver DH-143



Gardner-Denver Rotary 600

Pace Setters for Open Pit Production... Gardner-Denver Quality Drilling Equipment

For Blast Hole Drilling...

SUPER 5½" DH143 CRAWLER DRILLS—self-propelled heavy-duty drill. Packs plenty of deep hole punch in all formations.

DELUXE "AIR TRAC"® CRAWLER DRILLS—all controls for drilling, drill positioning and crawler drive are centralized for ease of operation. Available with 4" or 4½" drills. Also "Air Trac" without remote controls.

NEW GARDNER-DENVER "MOLE-DRILL"®—for use with rotary rig. An in-the-hole drill in two models for drilling 4¾" and 6" hole in hardest rock.

WAGON DRILLS—light- and heavy-duty for every need. **AUGER DRILLS**—both wagon drills and "Air Tracs" can be equipped with rotary motor for auger drilling.

QUARRY DRILLING AND BROACHING DRILLS.

DEEP HOLE DRILLS, DRIFTERS AND SINKERS—a complete line.

AIR FEED LEG DRILLS—and air feed legs for sinker mounting.

DRILL FEEDS AND CONTROLS—to fit every drilling job.

For Quality Drill Steel...

SECTIONAL DRILL RODS—highest quality—shot-peened and carburized to stand down-the-hole gaff longer.

RING SEAL SHANKS—replaces old-type water swivel without adding additional length to drill.

COUPLINGS—extra long, extra hard threads—made for longer drilling life.

For Air Power...

GARDNER-DENVER ROTARY PORTABLE COMPRESSORS—five models that offer water-oil cooling for all-weather operation, "THRIFTMETER"® fuel control, easy-to-get-at parts for speeding maintenance, clutch that eliminates cold-weather dry compressor starting. Sizes from 125 cfm. to 900 cfm.

STATIONARY AND SKID-MOUNTED COMPRESSORS—eight compact WB compressor packages that deliver continuous trouble-free performance. Water-cooled. Combination radiator-intercooler saves cooling water. Sizes from 142 cfm. to 1150 cfm.

For Building Your Own Jumbo...

JUMBO COMPONENTS—for tractor and truck mounting or building your own jumbo.

DRILL POSITIONERS—provide hydraulic swing and dump on end of booms for drill and feed positioning.

HYDRAULIC BOOMS—powered by creep-free hydraulic cylinders that operate at low pressures.

HYDRAULIC REMOTE CONTROLS—for remote-control operation of drills, feeds, drill positioners and booms from any centralized position.

Plus...

Bit Grinders • Centrifugal Pumps • Air Hoists • Drill Steel Shapers and Sharpeners • Sump Pumps • Air Maintenance Tools • Oil Forges • Air Line Oilers • Air Motors • Breakers • Tampers

*Trade-Mark



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BIGGEST DIGGER ON TWO CRAWLERS

The 10 yard dipper of this big digger is impressive, for the MARION 191-M is the world's largest loading shovel on two crawlers. Equally important on the iron range is the fast, small-machine cycle time that converts mountains into rail car loads in jig time.

MARION POWER SHOVEL COMPANY • MARION, OHIO

A Division of Universal Marion Corporation

How **STOODY HARD-FACING** keeps **STRIP MINING EQUIPMENT on-the-GO!**



A few beads of Stooddy Electric Tube Borium keep the points of these shovel teeth out to size, while unprotected teeth lose a full inch of length in the same time.

Heavy earth moving equipment used in open pit operations lasts far longer and requires fewer replacement parts when wearing surfaces are hard-faced with Stooddy alloys. The illustrations show typical examples of both manual and semi-automatic applications. For top welding speed—2 to 4 times faster than manual welding—use Stooddy semi-automatic tubular alloy wires... to speed maintenance during short down periods and between shifts, to save time and cut over-all costs.

Ask your Stooddy dealer for a free copy of the Stooddy Guidebook and the Semi-Automatic Wire folder; this literature covers hard-facing recommendations for all types of heavy equipment. Check the "Yellow Pages" of your phone book for local distributors—or write direct.

Shovel teeth are first hard-faced as shown with Stooddy 100 by the semi-automatic welder. Points are touched up manually during lunch time and at end of shift with $\frac{3}{16}$ " Stooddy Coated Electric Tube Borium.



Cutters and sides of scrapers are subject to severe wear. Semi-automatic application of Stooddy 100 provides protection.



Parallel beads of Stooddy 100 are run along bed of dump trucks to reduce wear in these areas. Material packs between beads, further reducing wear.

Ripper teeth have wearing surfaces hard-faced semi-automatically with Stooddy 100. 1 or 2 beads of Tube Borium hold points to size.



STOODY COMPANY

11932 East Slauson Avenue
Whittier, California

Technological Progress in the Mineral Industry

EXPLORATION must be based on realistic long range planning says Tom Gillingham
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HYDROMETALLURGY for new metals and low grade ores is strong view of C. J. Lewis
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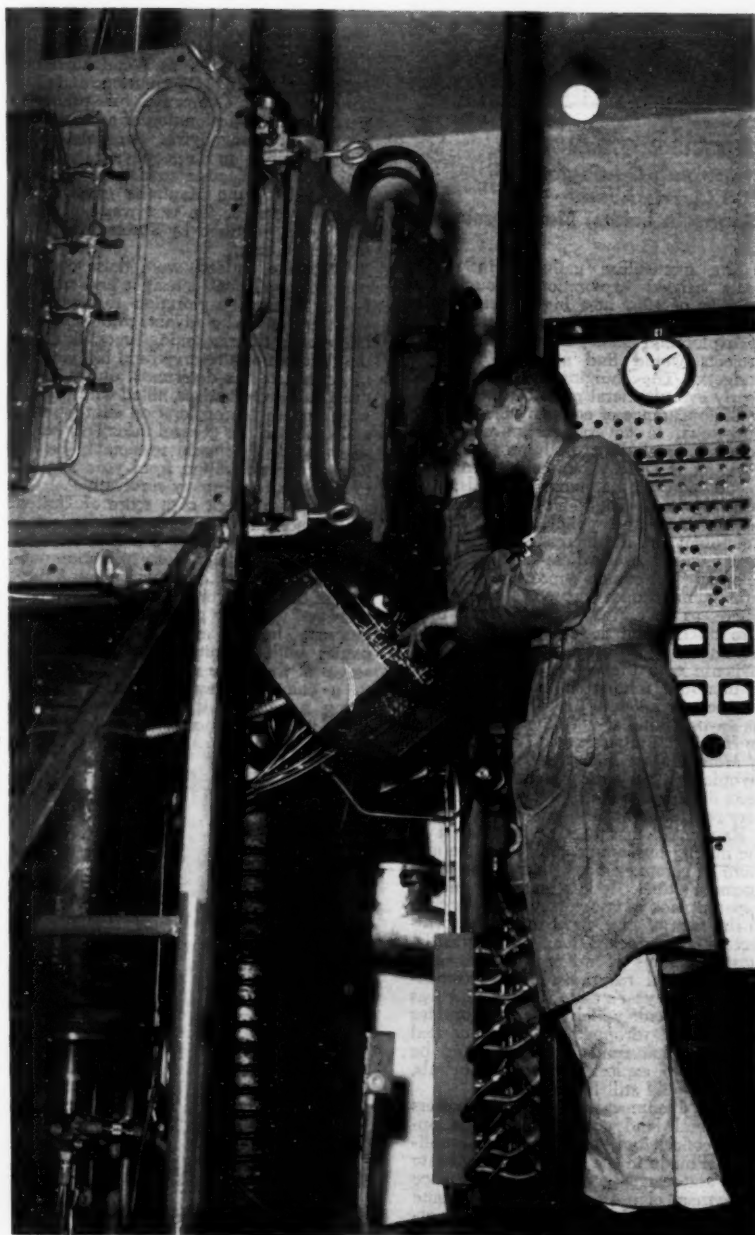
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ORE DRESSING progress shown by many method improvements reports F. T. Davis
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IRON ORE beneficiation marks 50 years progress on Mesabi Range says S. E. Erickson
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MINING looks for high speed high tonnage methods and equipment says R. M. Stewart
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Long Range Exploration Plans Necessary To Maintain Recent Discovery Success



THOMAS E. GILLINGHAM
Consulting Geologist
284 Morris Avenue
Mountain Lakes, New Jersey

The momentum gathered in recent years carried exploration through the summer of 1957 at a high level, but, as the autumn leaves fell, so did the hopes of exploration managers that their new projects would find approval in 1958 budgets. The bulging inventories of nearly every mineral product; the decline or disappearance of company income; the slow-down in government purchases of minerals, including uranium ore; the lowering of DMEA loan ceilings from 75 to 50 percent on most minerals; the arbitrary and frightening changes in mining laws and policy, as in British Columbia; and the increases in costs and taxes almost everywhere—all these developing in rapid succession—brought mining men once again to the point where, as an editor wrote in 1921, they "are talking and acting as if the world were about to return to the stone age and dispense with the use of metals, and as if, therefore, mining as an industry were destined to fall into irretrievable decay." As anyone familiar with the *Paley Report* or Harrison Brown's book *The Challenge of Man's Future* knows, such feelings are myopic, but they are based on the hard facts of our day-to-day economy and are very real to employer and employee alike.

Exploration has become a big part of the mining business, calling for more and more of company funds and of top management's time. Its inherent risks and its apparent lack of immediacy make its cost, in the face of glut, hard to justify to directors and stockholders. Consequently, most programs of mineral search came under critical reappraisal and retrenchment by the year's end. Management was forced to decide which projects or options should be dropped, which carried through; what funds, if any, should be allocated to exploration; what minerals, if any, should still be sought.

Acute dilemmas were faced in matters of mineral land acquisition, where options, concessions, and contractual obligations, made in the frenzied rush of late years and carrying onerous performance or payment clauses, were involved. Some optioned lands lost their immediate attractiveness and yet looked too good for

the long run to be surrendered to possible bidding from competitors. Prior contracts, often related to options, were largely responsible for carrying diamond drilling, for example, through the late months of 1957 at a high rate, comparable to the 1955 Canadian performance of 6,500,000 feet.

OPTIONING AND CLAIM STAKING dropped off substantially in North America, but there were staking rushes at Mattagami, Lake La Ronge, and elsewhere in Canada, and, apparently, an increase in exploration concessions, especially to groups of companies, in the remote lands of Africa, South America, the Caribbean, and Australia—parts of that great repository of mineral wealth known to geologists as Gondwanaland. Newmont Mining Corporation and Rio Tinto Mining Company, for example, participated in exploration of a large concession in Tanganyika. An interesting type of concession for geophysical mineral search with selective staking rights was innovated by the Manitoba government in recognition of the vast waste of time and money required by unselective "protective" staking.

Fortunate, indeed, were those companies with sufficient foresight and reserve funds to carry exploration through the doldrums and take advantage of property bargains in the slackening times. But, the desideratum of a reserve fund has yielded in general to tax deterrents and to more practicable alternatives, allied with profits, which cause the exploration effort to rise and fall with the general tide. This being so, what funds should reasonably be allocated to exploration from year to year to help assure company survival?

A random check of a score of United States and Canadian companies, large and small, reveals that, on the average, the amount spent in 1956 for exploration outside the home properties was about 8 percent of the figure for net profit. The range, however, was very great—from zero to 80 percent. The zero applied to a few companies with seemingly comfortable reserves at the home mine; the high figure to a company desperate to replace a dying mine. For the older, well-established companies, bent on long-range sur-

vival, the range was about 5 to 20 percent, depending, of course, on many factors. For International Nickel Company of Canada, Ltd., the average over the past decade was about 7 percent. In lieu of the ideal but often impracticable reserve fund, therefore, it would seem wise to maintain exploration at least on some percentage of net basis. Skeleton staffs could then be augmented in good times by temporary employees and contractors. This is usually what happens, but it is seldom a defined policy.

In January 1957, most commercial minerals were still attractive goals for search; by December, hardly any seemed worth the looking. During the year, lithium, beryllium, and boron flared with talk of astronautical fuels; silver, and a host of non-metals came under hopeful survey, and even lowly gold stirred from its long slumber. The ores of aluminum, iron, chrome, manganese, and molybdenum seemed to retain some attractiveness, judging from reported activity; a few companies, blessed with funds, continued diligently their searches for the old standbys—copper, lead, and zinc.

EXPLORATION IN 1957 was reasonably successful; despite curtailments, probably more discovered ore was brought into world reserves than was mined. Some may presently feel that too much ore has been found, but today's troubles certainly stem less from over-finding than from the natural tendency, abetted by capricious government policies, to get every new deposit into production as soon as it is found.

In reviewing the accomplishments of exploration, it is well to distinguish between the genuinely new discoveries of long-sought types of ore and the reappraisals of long-known but heretofore worthless deposits, such as the taconites, that have been brought into the category of ore by techno-economic breakthroughs. The rather sudden acceptance of 30 percent iron ores for beneficiation has eased greatly the exploration challenge for iron, just as selective flotation did for lead and zinc. With this in mind, the new "discoveries" of iron ore reported from almost every quarter must be judged. The vast tonnages of such ore reported in Quebec-Labrador, Ontario, the sub-Arctic, Australia, and elsewhere are astonishing and gratifying, but many of these deposits have been known, at least in a general way, for years. A notable exception, announced last year, was the geophysical discovery of deep magnetic iron ore in Missouri by St. Joseph Lead Company.

On the other hand, it was the remarkable success of exploration, an "ore finding breakthrough" if you like, that brought uranium ore into superabundance following the establishment of incentive prices based on suspected scarcity. New processes and new uses are now needed to absorb the newer metals, such as uranium, columbium, lithium, titanium, and zirconium, and once again expand the exploration challenge.

In 1957, much ore was found by routine mine geology in existing mining camps, but most of it was not formally reported. However, new silver-lead veins were announced from the Bunker Hill and the Dayrock mines in the Coeur d'Alenes of Idaho and the Keno Hill camp in the Yukon. New uranium ore discoveries in younger camps brought the total reserves of Ambrosia Lake to near 40,000,000 tons, the known reserves of Wyoming to about 9,000,000 tons, and total domestic uranium ore reserves to



DISCOVERY SUCCESS for uranium continued high in 1957 with more ore found than mined.

over 75,000,000 tons. Copper ore bodies were found in the old Cabildo camp in the province of Aconagua, Chile; ASARCO reportedly found over 65,000,000 tons of better than 1.0 percent copper ore at East Pima, Arizona, and another 10,000,000 tons of 1.5 percent copper ore in the East Jersey zone at Highland Valley, British Columbia, bringing the known reserves there to near 100,000,000 tons.

Exploration in the deep levels at Kirkland Lake, Canada disclosed high-grade gold veins at a vertical depth of 8,100 feet in the Wright-Hargreaves Mines Ltd.'s mine, now the deepest in the Americas. And, incidentally, on September 15, 1956, for the first time in mining history, a vertical depth of 10,000 feet was reached, at the Champion Reef mine in the Kolar goldfield, India. Rock temperatures on the bottom levels are about 150° F and working temperatures in places exceed 115° F.

Virgin deposits of copper ore were reportedly found at Suonenjoki, Finland; Legnica, Poland; Bahr el Ghazak, southern Sudan; and Chibougamau, Quebec, where Yorcian Exploration Ltd.'s, drilling through lake ice proved an ore body indicated by geophysics. American Metal Climax, Inc. has found over 100,000,000 tons of 1.0 percent copper ore, similar to the White Pine deposit, in Upper Michigan, and Craigmont Mines Ltd. announced a large copper-iron ore discovery in British Columbia. The possibility of a new major copper belt in South West Africa was reported, but confirmation or details are lacking.

Lead ore discoveries were made in the Boquirá area, Brazil; in West Pakistan; and in Australia, 400 miles northwest of Mt. Isa, by the Mount Isa Mines Limited. Exploration for nickel was underway in South Australia, Canada, and elsewhere. In the desolate Cape Smith-Ungava belt of Quebec, drilling last summer failed to disclose another Sudbury; the nickeliferous pyrrhotite apparently occurs there in relatively small, high-grade lenses in a long, trough-like formation of sediments with basic intrusives.

CANADA'S OUTSTANDING find of the year was Mattagami Syndicate's ore body in northwestern Quebec. The deposit, which was found by drilling an aeroelectromagnetic anomaly, lies in greenstone beneath 50 feet of overburden and contains at least 10,000,000 tons of ore averaging 10 percent zinc, 0.75 percent copper, 0.01 ounce gold, and 1.0 ounce silver per ton.

In the less glamorous field of the so-called industrial minerals, special mention can be made of exploration for asbestos, borates, diamonds, phosphate, and titanium minerals, although activity was not limited to the search for these. The success of the Cassiar Asbestos Corporation Ltd. in the mountains of British Columbia has spurred the search for asbestos elsewhere in the Canadian north-west, and several new deposits have been found, the largest lying near Dawson in the Yukon. In the Baie Verte area of Newfoundland, Advocate Mines Ltd. has opened a deposit said to contain over \$200,000,000 worth of chrysotile asbestos. In San Bernardino County, California, United States Geological Survey's drilling, based on careful geologic mapping and gravity surveys, cut 76 feet of colemanite-bearing beds, averaging 14 percent acid soluble B_2O_3 , at a depth of 1,100 feet. Kern County Land Company is following up this timely discovery. C. F. Davidson recently reviewed, in the *Mining Magazine*, Russian accounts of a



AEROELECTROMAGNETIC SURVEYS, particularly in Canada, became routine during the year. Sulphide conductors were found beneath as much as 300 feet of water or soil.

vast new alluvial diamond field associated with kimberlite pipes in the Vilyui River basin of northern Siberia. This discovery has removed the principal deficiency in the mineral economics of the U.S.S.R.

Considerable drilling and land acquisition activity followed the entry of Bear Creek Mining Company into the coastal plain area of Beaufort County, North Carolina, where tremendous tonnages of phosphatic sands, known since 1952, lie in gently dipping beds of Miocene age, unfortunately beneath 100 feet or more of water-soaked sediments. In the coastal plain near Lakehurst, New Jersey, ASARCO has blocked out, by shallow drilling, a sufficient tonnage of titanium-bearing sand to justify a plant for the recovery of ilmenite and leucosene, which constitute the bulk of the heavy mineral fraction. Other companies are interested in these deposits, which have been described by members of the New Jersey Geological Survey.

ORE FINDING has become more and more scientific through the use of geophysics and geochemistry and through additions to our knowledge of ore deposits and ore formation. While there were no very startling new methods reported in 1957, there were many improvements in technique and in the application, understanding, and acceptance of known methods and theories.

In the field of geophysics, the aeromagnetic (AM) survey became a recognized method for delineating rock structures over broad areas, and, through private contract and such arrangements as the Canadian Colombo Plan, was applied widely from Canada to Tasmania. The United States Geological Survey adapted the relatively cheap airborne scintillation survey to differentiate rocks of slightly different radioactivity between outcrops. The more expensive aeroelectromagnetic (AEM) approach, already credited with many discoveries, became routine for detecting sulfide conductors beneath as much as 300 feet of glacial, soil, or water cover, particularly as a follow-up of the AM method. Hans Lundberg described to AIME the use of the airborne gravimeter in detecting chrome and other minerals. Further improvements in induced polarization and related electrical methods point to an eventual solution of the toughest of all exploration problems—the detection and discrimination of valuable disseminated sulfides beneath hundreds of feet of barren cover. New streamlined, lightweight equipment appeared, typified by the new 15-pound Varian Associates' transistorized magnetometer replacing a

250-pound older model, and by the new portable seismometer developed by the United States Geological Survey. The trend of geophysics is toward still more airborne instrumentation and the use of electronic gadgets and computers.

Photogeology has become an accepted method for reconnaissance and for certain detailed work, thanks to the excellent stereoscopic aerial photographs and topographic maps that are being made available by all progressive governments and by private contractors. T. W. Mitcham described in *Mining Congress Journal*, November, page 66, a technique for pinpointing exploration targets, which he calls "mining photogeology," and P. A. Laylander discussed in *MINING WORLD*, April, page 56, the use of colored aerial photographs in ore search.

In Canada and the United States, geochemistry has been overshadowed by geophysics, but discernible lately is the gradual welding together of the rather prosaic testing of rocks, soils, water, and plants with a much broader concept of the occurrence and movement of elements, isotopes, and compounds in the earth's crust. This new geochemistry brings into focus and use a vast array of analytical and experimental data, which will yield sooner or later the answers to many questions of ore genesis and ore finding. The Russians have given far more attention to this subject than we have; at their Vernadsky Institute of Geochemistry alone, over 300 geochemists are at work, and many new discoveries, even in the frozen tundras of Siberia, have been credited to geochemistry. Excellent reviews of this subject in general and of radiogeology in Russia, by C. F. Davidson, appeared in the *Mining Magazine* in 1957.

Under the broader concept of geochemistry falls most of the research on ore deposits and ore genesis being performed with amazing success, but without coordination, at university and government laboratories. A very commendable plan to coordinate this work, proposed in 1956 by a committee of the National Science Foundation, failed to find, among the mining companies, the modest financial support required, but Dr. James Boyd, vice president of Kennecott Copper Corporation, chairman of the committee, reports that funds may be forthcoming from another source. In the face of such cogent arguments for research as were advanced by the Boyd Committee and by H. M. Bannerman in a paper in *Mining Engineering*, October, page 1,103, the reluctance of the mining industry to

Exploration

cooperate financially is incomprehensible.

THE RESEARCH CONTRIBUTIONS of 1957 cannot be reviewed here with the justice due the many authors, whose papers appeared in the scientific press. They include (1) records of observation, (2) records of experimental work, (3) logical reasonings from assembled data, and (4) broad hypotheses. Some papers cover all four categories.

In 1957 there was an appalling dearth of good, sound descriptions of ore bodies—the fundamental records without which science cannot progress. A few excellent papers did appear, including United States Geologic Survey Professional Papers on the West Shasta, California copper-zinc district, the Garfield, Colorado, complex ores, and the Congonhas iron ore district of Brazil; a U.S.G.S. Bulletin on the mineral deposits of Central America; Pelletier's paper on San Manuel geology, Lacy's on Cuajone, Peru, Richards and Courtwright's on Toquepala, Peru (Mining Engineering); and Campbell's on the Verna mine at Beaverlodge (Bulletin, Canadian Institute Mining and Metallurgy).

In the category of experimental results, several very significant contributions were made. They included studies of isotopic ratios, from which the absolute ages of certain ores and associated rocks were determined and by which a start was made on differentiating sedimentary from hydrothermal ores; studies of the stability ranges of sulfide systems, especially of the sphalerite-pyrite-pyrrothite mixtures, from which clues as to the temperature range of ore formation were derived; and studies of the stability relations of minerals under various anhydrous and hydrothermal conditions and under various

ranges of temperatures and pressures, from the results of which there is evolving a better understanding of the probable nature of the ore forming fluid.

Notable among the papers based on logical reasoning from existing experimental and observational data, were Barton's on the limitations on the composition of the ore forming fluid, Bichan's on critical factors in finding hypogene ore, Morey's on the solubility of solids in gases, McKinstry and Kennedy's on ore mineral sequences, all *Economic Geology* and Holland's *Geological Society of America* on the interpretation of thermochemical data. Krauskopf's excellent discussion of the heavy metal content of magmatic vapor, *Economic Geology*, belongs in this category, though it admittedly invokes a number of questionable assumptions.

To the final group of papers belong those of controversial nature, usually on the subject of ore genesis, to almost every word of which, a dissenting voice calls forth. Thus, C. J. Sullivan, *Economic Geology*, on the basis of certain assumptions, in part implied, extended his hypothesis that relative heats of formation of minerals and diffusion of metals in a presumably dry environment can account for paragenetic sequences, zoning, and other ore phenomena better than can the hydrothermal theory. Krauskopf, (op.cit.) by thermodynamic reasoning from other assumptions, concluded that both Sullivan's approach and the earlier volatile sulfide hypothesis of J. S. Brown are untenable; that, rather, vapor transport may be the answer. Reports of laboratory work by Howe and Burnham, *Geological Society of America*, supported the latter conclusion. C. L. Knight, *Economic Geology*, advanced a "source bed concept," which

holds that many sulfide ore bodies are derived from sulfides originally deposited syngenetically in a particular sedimentary horizon and later, by temperature rise, transferred more or less to new loci, commonly, but not always, within the original horizon. On the origin of specific deposits, diverse opinions likewise found outlets. Robertson and Steenland (AIME) proposed a placer origin for Blind River uranium ore, as did Bain (AIME) for Blind River, Witwatersrand, and the Shinarump uranium; but C. F. Davidson, *Economic Geology*, advanced strong arguments for the epigenetic origin of uranium in ancient conglomerates. Bain (op.cit.) and Boetzen (Geol. Foren. Forhandl.) came out for an epigenetic, if not hypogene, origin for the Rhodesian coppers; but Rand (AIME) subscribed to an essentially syngenetic origin for the White Pine copper ores, but he admitted some subsequent transfer. So goes the battle of the geneticists, providing zest to the science.

In conclusion, may we repeat that exploration has become a vital part of the mining business, along with development, extraction, and beneficiation. It is an operation, not merely a research; but, just as rock breaking in the mine and grinding in the mill are always subjects for study and improvement, so are the tools of ore finding constantly to be improved by experiment and theory. As Evan Just, in his recent paper "A Look at Exploration," *Mining Congress Journal*, so well points out, management must recognize exploration's inherent perplexities and geologists must see its cold economic facets. The past year brought exploration to trial, not of its own making but from which it will certainly emerge stronger than ever, to face the great challenges of the future.

Look To Hydrometallurgy For Winning The New Metals and Treating Low Grade Ore



By C. J. LEWIS

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The progress of chemical technology both in and into the mining industry during 1957 was reflected more by laboratory research and piloting activities than by new commercial operation.

There was continuing indication that chemical processing is the most promising route for winning the newer metals, whereas new or improved chemical technology must be developed to render tailings and low-grade ore deposits commercially attractive. Chemical industries continued to examine entree into the metals field as a natural expansion of their operations, while the mining industry continued some research on the application of chemical techniques.

From a mining industry viewpoint, 1957 may also be described as a "year of shadows"—for the technical literature is abundant with reference to laboratory and pilot plant developments, forecasting revolutionary procedures in the processing of ores and concentrates. From scanning such references, one gets the impression that the mining industry is but on the threshold of research.

To list the many chemical developments of present or potential interest to the mining industry is beyond the scope of this article; only the highlights can be touched upon. For more details, the reader is referred to authoritative indexes.

Elements particularly in the limelight during 1957 were lithium, titanium, zirconium, boron, columbian-tantalum, the rare earths, thorium, nickel-cobalt, aluminum, magnesium, and beryllium. Processes of particular significance in-

clude solvent extraction, chlorination, selective leaching, sulfate roasting, and high-temperature smelting.

LITHIUM: In the field of lithium, American Potash and Chemical Corporation formed a new subsidiary, San Antonio Chemicals. Liquors from APC's lithium hydroxide processing are further processed by SAC to produce a mixed salt composed of the carbonates of potassium, rubidium, cesium, sodium, and lithium. SAC is researching processes for isolating the compounds of rubidium and cesium. In another lithium development it is reported that Montgarry Explorations, Ltd., Toronto, Canada, will use Scientific Designs' process which employs a chloride volatilization to directly produce lithium chloride and a cement byproduct.

TITANIUM: If the literature may be used as a guide, the most researched metal during 1957 was titanium. Products from Titanium Metals Corporation of America, Electro-Metallurgical Company, Cramet, Inc., DuPont Company, and Dow Chemical Company resulted in a record output of titanium sponge. Stauffer Chemical Company disclosed a reportedly new metallic titanium process believed to utilize catalytic disproportionation starting with titanium tetrachloride and proceeding through the subchlorides. Armour Research Foundation reported developmental work to make pure titanium tetrachloride from ilmenite and low-grade ores. This process is based on a classical quantitative method for the separation of titanium, and might eventually replace the chlori-

nation process. The Institute of Technology, Helsinki, Finland, reported on the chemistry and thermodynamics of the chlorination of ilmenite. Significantly, it is concluded that, unless specific catalysts are found for increasing the rate of chlorination of TiO_2 preferentially (or reducing the rate of chlorination of FeO and Fe_2O_3), it will be necessary to find a method of removing iron from the ore prior to chlorination.

Mallory-Sharon Titanium Corporation, Niles, Ohio, reported a new electrolytic process for the recovery of titanium scrap. In this process it is claimed that scrap quality appears unimportant, and that the end product is large crystals of pure titanium metal formed on a steel cathode in a heated electrolytic solution. A patent application (Australian 22815/56) by Commonwealth Scientific and Industrial Research Organization discloses that ilmenite can be converted to rutile. Starting with a low-grade titanium ore and special heating, rutile crystals are produced. The mass is then selectively leached with sulphuric acid to result in a skeletal arrangement of rutile crystals, thus producing a high-grade titanium concentrate.

ZIRCONIUM: Nuclear demands continued to dominate the zirconium sponge picture in 1957. However, producers began to probe the commercial market, particularly the chemical and petroleum industries, because of zirconium's outstanding corrosion resistance properties. The U. S. Bureau of Mines at Albany, Oregon, reported a new process for making reactor-grade hafnium and zirconium. The new process is essentially a modified Kroll reduction of the tetrachloride. The Bureau claims that the product made by this process is better than that made by present reduction and separation techniques. U. S. I. Chemicals division of National Distillers and Chemical Corporation began studies on a zirconium process developed in Australia by the Commonwealth Scientific and Industrial Research Organization. This

process involves selective reduction of zirconium tetrahalides to trihalides. U. S. I. hopes to use the process in the new 2,000,000-pound-per-year zirconium plant under construction at Ashtabula, Ohio. The U. S. I. also piloted a CSIRO process, using a methyl isobutyl ketone for the separation of zirconyl and hafnyl chlorides.

BORON: The attention received by boron during 1957 is not surprising. Boron-containing fuel additives continue to gain in popularity; boron is used in the so-called "exotic fuels" for military aircraft; and boron-bearing plastics are being considered for lightweight shielding in airborne nuclear propulsion systems. However, in spite of the boom in boron mining and the exploration of new boron reserves, there was little change in the borax refining process.

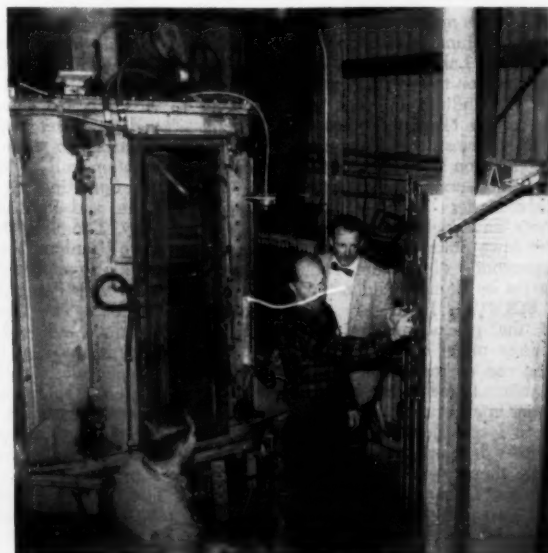
COLUMBIUM AND TANTALUM received much attention in 1957. The U. S. Bureau of Mines at Albany, Oregon, reported a liquid-liquid extraction process using hydrofluoric acid, sulphuric acid, and methyl isobutyl ketone to separate the two metals and simultaneously remove iron and other impurities found in the ore. Fansteel's liquid-liquid extraction process at its \$6,500,000 Muskogee, Oklahoma plant, continued to be tested. Columbium is of interest to nuclear researchers because it is suitable for cladding cores of fast reactors. It is effective in preventing the fission products from entering the system. It also surpasses other metals, such as zirconium, molybdenum, and vanadium, in resistance to heat and corrosion. It has been forecast that if columbium alloys can be sold at competitive prices, demand will reach 1,000,000 pounds per year. In a process developed jointly by Stauffer Chemical, Mallory-Sharon, and Temescal Metallurgical Laboratory, Richmond, California, electron bombardment melts ingots in high vacuum, thus removing volatile impurities. The first probable application of this process is reported to be the commercial production of high-

purity ductile columbium. Because columbium is so active chemically near its melting point, Westinghouse Electric Company's "cage zone melting" should aid in the design of columbian alloys. In this process the metal bar is moved up and down inside a high-frequency area which melts the bar from the inside out. Corners of the bar do not melt, but form a cage which traps the molten metal. As the bar rises through the high-frequency zone, a molten zone of columbium is caused to travel down the bar from top to bottom, thus producing the metal in its ultra-pure form. The importance of new techniques for the recovery of columbium is emphasized by the number of firms engaged in process development and the relative scarcity of actual producing processes.

NICKEL AND COBALT: There were significant developments pertaining to nickel and cobalt recovery during the past year. Freeport Sulphur Company, having successfully completed pilot planting, announced plans to build a plant at Moa Bay, Cuba, involving open-pit mining, acid leaching with sulphuric acid, and then shipment of the mixed salt to a Louisiana plant for separation and reduction of nickel and cobalt. Rated annual capacity of the plant will be 50,000,000 pounds of nickel and 4,400,000 pounds of cobalt. In addition, National Lead Company completed expansion of the government-owned nickel producing facility at Nicaro. This plant, after expansion, will have a capacity of 50,000,000 pounds of nickel yearly. The U. S. Bureau of Mines Northwest Electro Development Experiment Station at Albany, Oregon, announced a new leaching process that holds promise of improved recovery of nickel from Nicaro, Cuba, ores. The present process starts with the roasting of a nickeliferous iron ore to reduce nickel and cobalt to metallic form. These metals are then leached with ammoniacal solution and precipitated as carbonates. USBM has tackled the problem from two sides: separation



ZIRCONIUM REDUCTION plant of U. S. Bureau of Mines, Albany, Oregon, where a new process for making reactor grade metal was reported.



HIGH PURITY ductile columbian metal is made commercially in this high vacuum furnace of Temescal Metallurgical Laboratory.

Hydrometallurgy

of cobalt from nickel solution by chemical or electrolytic means; and selective leaching of nickel from the carbonate followed by electrodeposition of the nickel. Best results to date, according to the Bureau, were obtained by leaching the carbonate with a nickel sulfate-boric acid electrolyte. However, more work is needed before the process can be scaled up.

In still another development, Metallurgical Resources, Inc. installed the revolutionary "smelter-less" Sill process on a 20-acre Hudson River waterfront site at Newburgh, New York, for treating "problem" ores with high contents of arsenic and sulphur from which cobalt and other strategic metals are obtained. In this process, leaching of arsenic and sulphur from ores is accomplished by autoclaves which replace conventional furnaces. With these impurities removed, cobalt and nickel, as well as silver, copper, and other metals, are successively precipitated along the processing circuit.

RARE EARTHS AND THORIUM: The attention received by the rare earths and thorium in 1957 appears to be considerably less than in 1956. Horizons, Inc., of Cleveland, Ohio reported research activities on the development of a liquid-liquid extraction process using an organo phosphate reagent and selective stripping for separation and purification of rare earth compounds. Davison Chemical Division of W. R. Grace Company indicated intentions to terminate extraction of thorium for the AEC at Curtis Bay, Maryland, while at the same time building a new plant at Erwin, Tennessee, to produce uranium, thorium, and rare earth metals for commercial sale. High-purity oxides of many of the rare earths for experimental purposes were in better supply in 1957.

Metal Hydrides of Beverly, Massachusetts, announced the development of a tetraiodide dissociation process for producing super-pure thorium metal. The MH process uses reactor-grade thorium as raw material and converts this into "crystal bar" metal by a process similar to the tetraiodide routes previously considered for commercial use in zirconium and titanium production. The Argonne National Laboratories, Lemont, Illinois, reported on the solvent extraction behavior of scandium, thorium, and zirconium in certain tetrabutyl phosphate mineral acid systems; the University at Liege, Belgium, on separation of the rare earths by ethylenediaminetetraacetic acid; the Laboratories Terres Rares, Bellevue, Paris, on the chemistry of scandium; and the Iowa State College, Ames, Iowa, on separations of yttrium and some rare earths by liquid-liquid extraction.

SODIUM: Interest in the technology of the production and application of sodium metal continued strong in 1957. The use of sodium in the reduction of titanium tetrachloride continued to be a major application, but some uncertainties as to future demand for sodium in this process developed during the year. However, there were developments to indicate that from a long-range point of view, new uses for sodium might be developed in processes for producing zirconium, columbium, tantalum, and beryllium.

BERYLLIUM: No major developments were reported with reference to new

technology for beryllium recovery or application. The government-owned plant operated by Brush Beryllium Corporation at Luckey, Ohio was shut down, reportedly due to lack of capacity. Almost simultaneously, Brush placed on stream a new \$4,500,000 beryllium plant at Elmore, Ohio. The Elmore plant is designed to turn out 240,000 pounds per year of beryllium hydroxide and 120,000 pounds per year of vacuum-cast beryllium metal. Much of this will go to the AEC, although other outlets will be beryllium alloys and special compounds.

ALUMINUM: Interest in aluminum chemistry appeared to be largely confined to the development of more efficient analytical procedures in connection with stepped-up exploration activities for bauxite. One interesting development was the process reported by the Illinois Institute of Technology, wherein aluminum reduction is the first step for producing titanium directly from the oxide. So far this process has been on a laboratory scale only. A possible new use for magnesium is also involved in that magnesium is added to the aluminum titanium alloy to remove the excess aluminum.

MANGANESE: Desire for production of manganese materials from domestic ores increased sharply in 1957. The U. S. Manganese Corporation was formed to initiate activities at Orange, New Jersey, for pilot testing the Sheer-Korman high-intensity arc process for making metallurgical-grade manganese from Colorado rhodonite. It is hoped this process will allow recovery of manganese from the plentiful manganese silicate deposits. The U. S. Bureau of Mines reported on a so-called "percolation leaching" process for recovering manganese from ores which cannot be handled by conventional methods because of their clay-like characteristics. This method consists of forming crushed ore into piles, passing sulphur dioxide gas upward through them, and percolating water downward through the piles. In this process the sulphur dioxide gas dissolves the manganese to result in a manganese sulfate solution which can then be further treated to yield a product suitable for making ferro-manganese.

SOLVENT EXTRACTION: Process-wise, liquid-liquid extraction, more commonly called solvent extraction, continued to attract major attention. The new Texas Zinc Minerals Company's new uranium mill at Mexican Hat, Utah, began operating via the solvent extraction route, and Kermac Nuclear Fuels Company, Gunnison Mining Company, and Vitro Uranium Company, all indicated intention to apply solvent extraction in uranium mills being designed or under construction. The Dow Chemical Company described a liquid-liquid extraction process for preparing the green salt, uranium hexafluoride, directly from uranium mill sulphuric acid leach solutions. In this process an organo phosphate (cation exchange) is employed in one extraction cycle, and an amine salt (anion exchange) is used in the second extraction cycle. This double purification thus sets the stage for the precipitation of uranium hexafluoride. Dow states that the technology of this process, based on laboratory data, appears attractive, but piloting the process is necessary before an eco-

nomic appraisal of its merits can be made. However, of probably more significance was the application of solvent extraction to the recovery of vanadium and to the removal of impurities in processes for producing manganese and tungsten. Several new SX reagents appeared on the market. The Colorado School of Mines Research Foundation, Inc. was heavily engaged in solvent extraction research during 1957.

As may be gleaned from much of the foregoing, halide chemistry, particularly high temperature chlorination, received a rich measure of attention in 1957. It has been confidently predicted that fluorine, chlorine, and possibly iodine will be the magic bridges of the future to make it possible to move from ore concentrate directly to a high-purity metal without need for the present conventional intermediate steps.

LEACHING: Developments in specialized leaching in 1957 also forecast the tremendous potential of the application of chemistry to metals recovery processes. Pressure leaching and leaching with ammonia, sulphur dioxide, nitric acid, and sodium carbonate received much attention. An interesting discussion of these developing technologies, by L. W. Coffey, appears in the January 27, 1958 issue of *Chemical Engineering*. Sulfate roasting, particularly in fluidized beds, is a developing process of particular interest. In this application the desired sulfate is formed in a furnace and then selectively leached away from the undesirable material. For example, sulfides of iron, nickel, cobalt, cadmium, zinc, and copper form sulfates when roasted in air at controlled temperatures. At still higher temperatures, such sulfates decompose selectively to metal oxides. The development of the fluidized bed type of roaster now permits the close temperature control necessary during this kind of an operation. Sulfate roasting is also applicable to ores that can be mixed with cheap sulphur sources.

SUMMARY: The foregoing brief digest of 1957 chemical developments in or of possible interest to the mining industry reflects a healthy, aggressive situation. There may be a tendency at times to overemphasize chemical developments, particularly because so many of the chemical technologies are new to the mining industry; a closer examination often reveals that the chemistry itself has long been known, and even already in use by the chemical industry in a parallel application. No doubt the extensive application of chemical processing in the uranium industry has been largely responsible for the present high interest in applications of chemical technology to mining industry problems. However, chemical developments in the mining industry in the years ahead are apt to be less spectacular, if for no other reason than that they will have become an expected and accepted route in this industry. As others have so ably pointed out, the mining industry must turn more and more to chemical technologies and allocate more research and development dollars for this purpose; otherwise, the chemical industry itself will aggressively enter the mining field as the result of natural expansion pressures.

New RIP Process, Solvent Extraction, Lower Concentrate Price Feature U_3O_8



By H. L. HAZEN
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Mill Operators
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During 1957 the uranium milling industry continued its swift pace in developing new processes, improving old ones, and testing new equipment.

RESIN-IN-PULP: More than half of the uranium concentrate produced in the United States during 1957 was again recovered by the acid-leach resin-in-pulp method. Two new mills using this process went on stream during the year; the Western Nuclear Company's plant in Wyoming, and the mill at Maybell, Colorado, operated by the Union Carbide Nuclear Company. The Western Nuclear mill uses the same resin-in-pulp technique used in five mills during 1956. The Union Carbide Nuclear Company's mill uses a different technique for its RIP process.

The RIP process recovers dissolved uranium from acid slime pulp by adsorption on anion exchange resin beads. In the first six RIP mills, which includes Western Nuclear, the resin beads are contained in acid-proof screen baskets that oscillate up and down in a trough through which acid-leached slime pulp flows. The resin beads are retained in the baskets by the screen but still have sufficient contact with the pulp to adsorb the dissolved uranium. The anion exchange resin beads never leave the basket during normal operation. Results similar to a counter-current flow of the beads and the slime pulp are obtained by controlled switching of the flow of pulp through the troughs in which the baskets oscillate. When a laboratory first conceived the idea of adsorbing uranium on anion exchange beads from a slime pulp, it was hoped that the resin beads could be handled in agitators by the same technique the Golden Cycle Corporation's Carlton mill at Cripple Creek, Colorado, uses for recovery of gold from cyanide pulps with activated charcoal. Laboratory tests soon showed that commercial resin beads were degraded by any normal agitation in a pulp, and the loss of fine resin would cost too much. The oscillating screen baskets solved this problem.

During 1957 Infilco, Inc., Tucson, Arizona, designed equipment to use anion exchange resin beads in a slime pulp

in a true continuous counter current flow. They claimed that the gentle agitation in their machine would not degrade the anion exchange resins currently on the market. Union Carbide Nuclear Company tested the equipment with Permutit resin and decided to use a modified Infilco machine in its new RIP plant at Maybell, Colorado. The modified design of the Infilco equipment uses Sweco vibrating screens to separate resin beads from an acidified slime pulp containing 20 percent solids. This pulp contains three times the quantity of slime that can be tolerated in any of the RIP plants using baskets. The metallurgical results at the Maybell RIP plant are reported as very satisfactory and erosion of the resin beads within tolerable limits. If time confirms the results reported above, then the metallurgical industry could well have use for RIP in the treatment of other metals as well as for recovery of uranium.

One of the major troubles that the basket RIP plants have had is in breakage of screen cloth used in the baskets. In the mill it built for Western Nuclear, Western Knapp Engineering Company designed and installed baskets in which the screen cloth is held under tension at all times. Western Nuclear reports that they have not had one screen break because of flexing since start of operations.

At Bluewater, New Mexico, the Anaconda Company has changed the reagent used for elution of resin in its RIP plant. Anaconda is now using an acidified sodium chloride solution instead of the ammonium sulfate eluant formerly used.

At Edgemont, South Dakota, Mines Development, Inc. decided to add the eluex system to the RIP plant so that all tailing water could be returned to process.

In the eluex process that Mines Development is now designing for its Edge-

mont mill, the Permutit anion exchange resin beads will be eluted with 10 percent sulphuric acid solution. Uranium will be recovered from this strong acid solution by solvent extraction. The mill will use di-2-ethyl hexyl phosphoric acid and tri-butyl phosphate dissolved in kerosene as the extracting organic. After removal of uranium, the strong barren acid will be used partly for acidifying the pulp in the leach circuit and partly re-cycled for eluting uranium from the RIP circuit. All mill tailing water overflow from the slime pond will be recycled to the mill and used as a wash in the sand washing circuit.

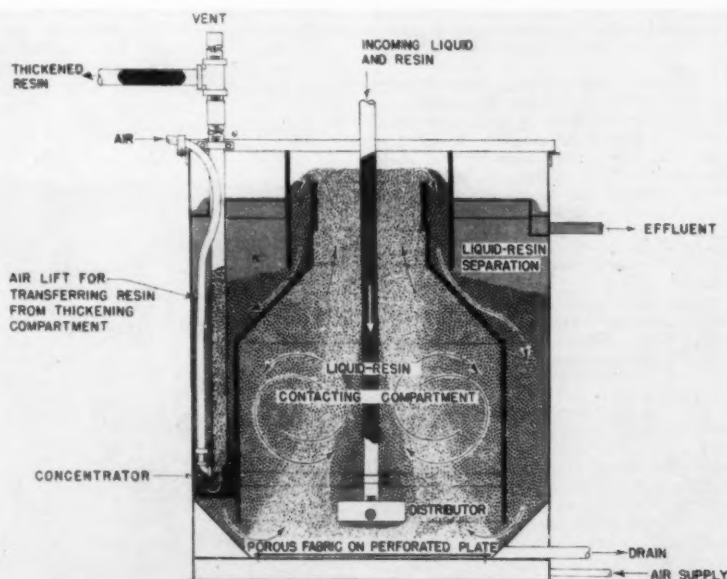
Every uranium RIP plant continued to enjoy the great advantage that is inherent in the process, namely, an extremely low soluble loss. This low soluble loss averages between 0.1 and 0.4 percent of the uranium dissolved from the ore.

COLUMN ANION EXCHANGE: Column anion exchange gained one customer and lost one customer during 1957.

The uranium mill at Shiprock, New Mexico, owned and operated by Kerr McGee Oil Industries, Inc., shut down its anion exchange columns and replaced them with a solvent extraction circuit. The reason—less cost and more profit.

The Dawn Mining Company, a subsidiary of Newmont Mining Corporation, went on stream at Ford, Washington, with column anion exchange to recover uranium. This mill uses a rather unique counter current acid leach with counter current decantation washing. The details of this operation are reported by Don Hargrove, assistant manager, in MINING WORLD of February 1958.

Column anion exchange has the advantage of a low cost for eluting and recovery of uranium from the resin. Column ion exchange equipment can be built of relatively inexpensive material that will stand an acidified sodium chloride solution. Any RIP resin can be stripped with the same chemicals, but the corrosive action of an acidified sodium chloride makes it necessary to build the RIP screens out of Hastaloy and other



TRUE CONTINUOUS counter current flow of uranium rich pulp and anion exchange resin beads was tested for first time in 1957 at a commercial uranium mill.

Uranium Metallurgy

costly alloys. Because of this, only Anaconda uses acidified sodium chloride for elution of resin in an RIP circuit.

UPGRADING. Vanadium Corporation of America continued to profitably operate its upgrader at Monument No. 2 mine in Arizona. The waste and overburden at this mine is ground wet and the slime separated from the sand in classifiers. The uranium concentrates into the slime which is filtered and dried in rotary kilns and then shipped to Durango, Colorado for uranium recovery. This upgrading produces a product containing about 2.0 percent U_3O_8 and 0.25 percent U_2O_5 .

During 1957 another "upgrader" operated profitably. This plant is owned and operated by COG Minerals Corporation and is located in Frye Canyon, Utah, and recovers uranium, copper, and certain sulfide minerals by gravity concentration. The company found in laboratory tests that ore from this particular area could be concentrated by carefully controlled wet concentration methods. The concentrator uses proven equipment such as jigs, tables, and Humphreys spirals. The mill tailing runs about 0.02 percent U_3O_8 regardless of the grade of ore concentrated, and the concentrates are held down, when possible, to 5 to 10 percent U_3O_8 containing about 20 percent copper. These concentrates are shipped to the new solvent extraction mill of Texas-Zinc Minerals Company at Mexican Hat, Utah.

The chemical upgraders being built by Union Carbide Nuclear at Slick Rock, Colorado and at Green River, Utah, were not completed in time to start operating in 1957.

SOLVENT EXTRACTION: Two new mills designed to use solvent extraction for recovery of uranium went into operation during 1957. A 750-ton-per-day-capacity plant was built by Texas-Zinc Minerals. This mill uses a Podbielniak centrifugal machine instead of customary mixer-settler units in its solvent extraction circuit. The 250-ton-per-day mill built by the Gunnison Mining Company at Gunnison, Colorado, started crushing ore the last of the year and uses mixer-settler units in its solvent extraction circuit.

In every uranium mill using solvent extraction, the extracting organic is dissolved in kerosene. This kerosene mixture then flows counter currently to the acid aqueous pregnant solution through equipment that alternately mixes and then separates the kerosene mixture and the aqueous solution.

Three of the five plants use di-2-ethyl hexyl phosphoric acid mixed in kerosene as the extracting organic. They also add tri-butyl phosphate to the kerosene to prevent phase separation in the settlers. The mills recover uranium from this di-2-ethyl hexyl phosphoric acid by stripping with 10 percent soda ash solution.

The Vitro plant in Salt Lake uses dodecyl phosphoric acid dissolved in kerosene to recover uranium from acid aqueous pregnant solution. The Dow Chemical Company, at Pittsburg, California, is responsible for most of the research work with dodecyl phosphoric acid. Uranium is recovered from the acid pregnant organic solution by counter current treatment with concentrated hydrochloric acid. Soda ash can not be used for this particular organic because the sodium form of dodecyl phosphate is soluble in soda ash solutions. The pregnant hydrochloric acid is very high grade and

its volume is small. Excess hydrochloric acid is distilled and recovered for reuse.

At Mexican Hat, Texas-Zinc Minerals uses a Rohm and Haas amine called 9D-178. This amine acts as a liquid anion exchange agent in contrast to organo-phosphoric acids which act as cation exchange agents. The amines have two advantages over organo-phosphoric acids. They do not extract ferric iron from aqueous acid pregnant solutions and uranium can be stripped from the organic with an acidified sodium chloride solution which is relatively cheap.

Every mill using solvent extraction is pleased with the metallurgical results. But the solvent extraction process has not yet advanced to the point where it can be used in slurries such as are treated in the RIP process. This means that the leached pulp must be washed substantially free of uranium before mill tailing is discarded to waste. Soluble loss of uranium in the washed tailing should be charged against solvent extraction when profits from that method are compared to profits from an RIP plant. Another important cost in the solvent extraction treatment is the loss of organic in the raffinate. This loss amounts to approximately one-half gallon for each 1,000 gallons of aqueous pregnant solution treated. Several ideas have been advanced to cut the cost of this loss, but none of these ideas have yet been put into practice.

NEW MILLS BEING DESIGNED:

At the present time four mills are being designed for the Ambrosia Lake area in New Mexico, one mill is being designed for Riverton, Wyoming and one for Lakeview, Oregon.

The mill being designed by the Lakeview Mining Company for Lakeview, Oregon will use a hot acid leach to dissolve uranium and then recover the uranium from acid pregnant aqueous solution by solvent extraction.

The mill at Riverton, Wyoming, being designed for Fremont Minerals, Inc., will be a two-circuit plant. One circuit will dissolve uranium with sodium carbonate solutions and the other circuit will dissolve uranium in acid. Uranium dissolved in acid will be recovered from aqueous pregnant solution by solvent

extraction. The organic pregnant solution will be stripped with soda ash pregnant solution from the carbonate circuit and uranium finally recovered as yellow cake by precipitation of all soda ash pregnant solutions with caustic soda.

FUTURE TRENDS: The headlong advance of the uranium milling industry in the United States was suddenly stopped in October by an announcement from the director of Division of Raw Materials, AEC. Jesse C. Johnson said in substance that the government had contracted for all the uranium concentrate it needed. Since the only important purchaser of uranium concentrate in this country is the AEC, this meant that no new contracts for purchase of uranium concentrate would be granted and that no new mills would be built except under certain unusual conditions.

Shortly after Congress created the AEC, that commission formulated policies that resulted in the swift discovery of large bodies of uranium ore in western United States and in the development of new metallurgical processes to treat those ores.

A crash program in research was started, and altogether approximately \$30,000,000 has been spent to date by the government in research to develop methods of recovering more uranium more cheaply from its ores. This crash program paid off in a big way because it developed new and less costly metallurgy, such as resin-in-pulp, solvent extraction, and related techniques. These new methods are paying immediate dividends to the government, and they will be of great value in the treatment of ores containing metals other than uranium.

The engineers working for the AEC have taken advantage of everything the laboratories discovered. In tough but fair contract negotiations they have forced down the prices paid by the AEC for uranium concentrate because of improved mill designs that were developed, because of larger capacity mills, and they demanded and got reduced U_3O_8 prices because of new processes developed in laboratories working under AEC contracts. Director Johnson's release of October 28, 1957 reported the following decrease in prices paid for U_3O_8 .

Year	Average Price Paid by AEC Per Pound of U_3O_8
1956	11.60
1957	10.50
1958	9.60
1959 (Estimate)	9.30

It is publicly reported that United States production bought by the AEC will probably level off at about 15,000 tons U_3O_8 per year. So the savings to the United States Treasury will total \$2.30 per pound for each of the 30,000,000 pounds of U_3O_8 , and this amounts to a saving to the taxpayer of \$69,000,000 per year.

Now that contract negotiations for new mills are about ended, the AEC is cancelling most of the contracts it has with laboratories for research on recovery of uranium from its ores. The larger uranium milling companies are already operating research laboratories of their own. The smaller uranium companies have no research laboratories capable of doing basic research work and these smaller companies hope that the AEC will find it possible to continue some fundamental research work.



TENSIONED SCREEN baskets were introduced in RIP circuits for the first time in 1957.

Ore Dressing in 1957 Featured Flotation, Grinding, Automation, and Mill Controls



By F. T. DAVIS
Manager, Ore Dressing Division
Colorado School of Mines Research Foundation, Inc.
Golden, Colorado

The outstanding developments during 1957 were increased application of the DSM screen, study of high-speed grinding mills, and increased use of electrostatic separation. An increasing application of automation was observed in plants constructed during the year.

CRUSHING AND GRINDING: There was continued interest in hammer mill crushing during the year although the problem of excessive wear with the harder ores has still to be resolved.

An interesting forum was held in Ottawa, Canada. D. A. Livingston, Chief Metallurgist, Golden Manitou Mines, Ltd., led the discussion concerning protective devices for jaw crushers. This meeting included both operators and manufacturers and concerned devices presently used and devices that are planned for the future.

H. J. Chalmers reported on the grinding practice of the HB concentrator in British Columbia of Consolidated Mining and Smelting Company of Company Ltd.

This plant uses rod mill-ball mill grinding. Some classifier overflow is returned to the rod mill feed to correct for feeding difficulties. A comparative test of 2-inch balls versus 1½ balls resulted in the smaller ball producing an increased grinding rate and with significantly less ball consumption.

The current methods for designing ball rationing charges were reviewed by Walter L. Crow, Engineer, Colorado Fuel and Iron Corporation. He pointed out that an intelligent ball rationing program requires considerable time and expenditure and that where feed is not constant, ball rationing is probably not justified.

Potash Company of America is presently using ceramic balls in the grinding of potash following preliminary crushing at Carlsbad, New Mexico.

L. E. Djingheuzian, senior engineer, Division of Mineral Dressing and Process Metallurgy, Mines Branch, Ottawa, Canada tabulated and reported work indices on a number of operating mills. This tabulation related work index to liner shape and ball wear and, to some extent, to mill diameter, critical speed, and percent of ball loading.

H. A. Wright, Allis-Chalmers Manufacturing Company, has described the systems of electrical controls for both crushers and ball mills. This paper for the mill electrical designer describes the large variety of electrical starting and protective devices now available for this type of equipment.

At the International Mineral Dressing Congress in Stockholm, Sweden, in September, A. Z. Frangiskos, Athens, Greece, and H. G. Smith, University of Leeds, England, described the effect of surface active agents in grinding quartz and calcite. They postulate that this type reagent can be used in grinding to prevent the reclosing of micro cracks encountered in the initial step of an attrition process. Significant increases in surface areas produced in grinding were obtained with the use of NaOH and Na₂CO₃ in grinding pulps.

R. T. Hukki, Finland Institute of Technology, described the preliminary results of his very fascinating study of grinding at supercritical speeds, i.e., up to 240 percent. Evidently a new grinding zone un-

common to conventional grinding is formed at these speeds between the grinding media and the shell of the ball mill. This work will continue and should be well worth following.

H. Tanner and T. Heikkinen of Outokumpu Oy, Finland, described the crushing and grinding practice at the Keretti plant in Finland. A conversion was made at this plant from steel balls to pebbles, and the speed of the mills was increased to 104 percent of critical. Lower pulp densities in the ball mill proved advantageous. This conversion resulted in over-all decreased grinding costs.

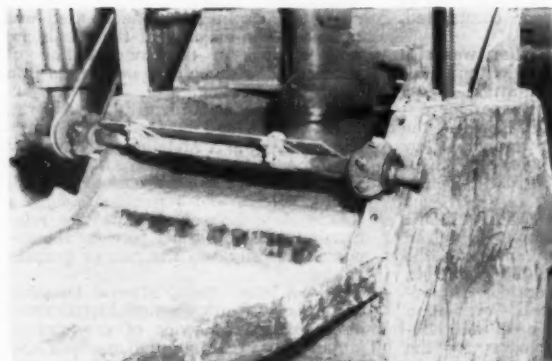
SIZING AND CLASSIFICATION: A noteworthy symposium on cyclones was held at the 1957 AIME meeting. During this symposium, E. C. Herkenhoff, chief metallurgist, Utah Construction Company, described methods of selecting the size and arrangement for cyclones for particular jobs. Fred Devaney, chief metallurgist, Pickands Mather & Co., discussed the use of cyclones in closed circuit grinding of taconite. Russ Salter, mill superintendent, Silver Bell, listed the many uses of cyclones in Arizona milling practice, including primary grinding, regrinding, production of smelter flux, degrittling lime slurries, and as flotation feed conditioners.

It is becoming obvious from many reports that the cyclone frequently affects a subsequent flotation operation, sometimes adversely and sometimes beneficially.

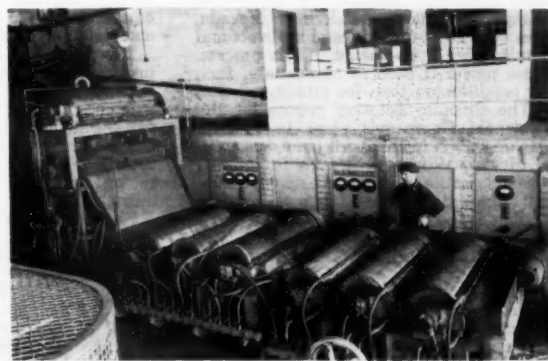
The performance of the Dorr-Oliver, Inc.'s DSM stationary screen received increasing attention during the year. This device was described in a paper by Paul L. Stavenger and Victor R. Reynolds. The screen reportedly has a high capacity for wet screening in the range of 8 to 48 mesh, requires little floor space, and has no moving parts. The screen reportedly will handle 200 to 500 gallons of slurry per minute per foot of width depending upon the particle size and separation size.

In a recount of the newer classification tools, Henry W. Hitzrot, Assistant International Administrator, described the Dorr-Oliver bowl desilter. This unit, which is not common in the non-ferrous industry, is similar but of cheaper construction than the standard bowl classifier. Present applications are in the glass, sand, and coal industries.

FLOTATION: C. L. Sollenberger, supervisor, Process Section, Research Laboratories, Allis-Chalmers Manufacturing Company, and R. B. Greenwalt, operating metallurgist, Cleveland-Cliffs Iron Com-



CINNABAR FLOTATION received a boost in 1957 as three mills used heavy mineral (copper sulphate) activation followed by xanthate collection.



MAGNETIC SEPARATION was of much interest in Scandinavia during the year. This unit is separating magnetite and ilmenite in Finland.

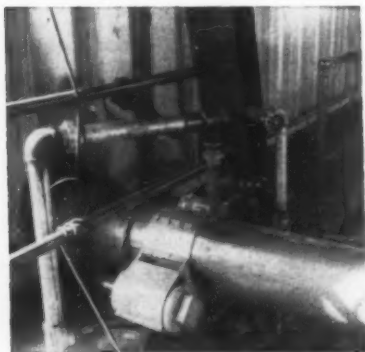
Ore Dressing

pany, described laboratory results of various silicates used in flotation processes. Silicates having a silicate-to-soda ratio in the range of 2.4 to 2.9 were proven most effective of the silicates when used in the range of 4.0 pounds per ton. When lesser quantities were used, there was not much difference in the performance of various silicates.

Marcello Billi, director, reviewed the lead-zinc flotation plant of Azienda Minerali Metallici in Italy. Vittorio Manfredi's process for the flotation of calomine by same company was described. Heating during the sulfidization step was essential in this process.

The molybdenum-copper flotation separation process at American Smelting and Refining Company's Silver Bell, Arizona mill was described. This process is basically the same as Phelps Dodge Corporation's Morenci process, which involves the use of sodium ferrocyanide and sodium cyanide as depressants. No roasting or pulp heating is employed.

Carl Rampacek, supervising metallurgist, Southwest Experimental Station, U. S. Bureau of Mines, and William A. McKinney, extractive metallurgist, U. S. Bureau of Mines, reported on their investigation of the copper segregation process. The oxidized copper ore is



NUCLEAR DENSITY GAUGES attracted much interest for measuring pulp densities in pipes.

heated with a reducing agent and a halide salt at 700°C to produce metallic copper which may then be recovered by ammonium carbonate leaching or by flotation.

A. W. Fahrenwald, consulting metallurgist, Moscow, Idaho, discussed emulsion flotation as contrasted to froth flotation. Emulsion flotation, as applied at Manganese, Inc., Henderson, Nevada, uses very large quantities of reagents and conditioning is important in this process. More power is used at Manganese, Inc., for conditioning than for grinding.

The ilmenite flotation process at the Otanmaki Company's plant in Finland was described in the April issue, page 49, of *MINING WORLD* by Urnos Runolinnä. The magnetite is removed magnetically from the ore, the ore is then thoroughly deslimed and the ilmenite floated in a pulp at a pH of 4.8 with fatty acid. The selection of fatty acid and pH of the acids are important in this process. Fatty acids rich in oleic and linoleic and low in resin proved best for this process.

Keith Kunze reported in *MINING WORLD*, September, page 64, on the mercury flotation process now being used in three mills in the Nevada-Oregon district. Former literature on mercury flota-

tion cited the use of sodium silicate and sodium carbonate for dispersion. Mr. Kunze, general superintendent, Getchell Mines, Inc., asserts these reagents are definitely detrimental to cinnabar flotation. His studies indicate satisfactory results with heavy metal activation, i.e., copper sulfate followed by collection with xanthates.

At the International Mineral Dressing Congress in Stockholm, S. I. Mitrofanov and V. G. Kusinkaya, Russian metallurgists, presented a paper on the use of sodium sulfide for desorption of flotation reagents from bulk sulfite flotation concentrates. This practice is presently being used in lead-zinc flotation separation at the Leninogorsk lead-zinc concentrator.

M. Rey, professor, Ecole des Mines de Paris, discussed the differential flotation of lead-zinc ores in regard to reagent practices related to the geologic state of the ore.

P. G. Kihlstedt, Swedish Royal Institute of Technology, described the flotation of Scandinavian hematite with tall oil emulsions. This process was a two-stage flotation arrangement with apatite removal.

M. A. Ejgeles, Institute for Mineral Raw materials, Moscow, reviewed the effect of depressants in non-sulfide flotation. A new contact measurement technique was described where the effectiveness of depressants was measured without the use of collectors. He concludes that, in non-sulfide flotation, depressants also affect the natural wettability of the minerals even in the absence of collectors.

MAGNETIC SEPARATION: J. Hall Carpenter, Carpco Manufacturing, Inc., discussed low intensity rotating magnetic field separating devices. His development of an induced roll separator with lift type action now in use in Australia was described. This apparatus is used for separations of minerals with relatively small differences in magnetic susceptibility. An interesting commentary in this paper was made on the possible future of wet high-intensity magnetic separation.

P. E. Cavanaugh, director of metallurgy, Ontario Research Foundation, and E. W. Williams, Research Cottrell Fellow, Department of Engineering & Metallurgy, Ontario Research Foundation, outlined the development of new dry magnetic separation devices developed at the Ontario Research Foundation. These machines provide concentrations of all particle sizes including dust by dry magnetic methods. Four types of equipment were designed, constructed, and tested for specific uses.

Dry magnetic concentration was also under development in Sweden and Finland in the iron ore industries. These machines involve a drum separator operating at very high speed, in which the non-magnetic material is thrown off by centrifugal force. (see Technology chapter on European Metallurgical Developments).

ELECTROSTATIC SEPARATION: Electrostatic concentration received more attention than usual during the year. F. N. Oberg and E. Northcott, Manager of Applied Research, International Mineral & Chemical Corporation described the application of the LeBaron-Lauver free-fall process for the electrostatic concentration of phosphate ore.

James E. Lawver, Research Specialist,

International Minerals & Chemical Corporation presented a paper on the fundamental aspects of electrostatic concentration of minerals as related to solid state physics.

The pilot plant results using electrostatic separation for concentration of feldspar was related by E. Northcott and I. M. LeBaron, Director of Research, International Minerals & Chemical Corporation.

The different electrostatic effects with static fields and high tension current fields was discussed in an article by J. Hall Carpenter, partner, Carpco Research & Engineering. He pointed out that in high tension fields polarity has little or no effect, and that mineral coating may not be so significant.

The separation plant at the Golding Keene Company mill at Keene, New Hampshire, using the electrostatic process for the separation of feldspar, was described by Grant S. Diamond. The Quaker Oats separator is being utilized in this plant.

The use of electrostatic separation for the concentration of scheelite was described by R. E. Barthelemy in *MINING WORLD*, September, Page 79. This separation was from a preconcentrate of



FIBER GLASS STACK 200 feet long was used at Chibuluma cobalt plant to resist corrosion.

scheelite and sulfides. Drying to 235° F. was necessary prior to electrostatic concentration in this laboratory process.

GRAVITY CONCENTRATION: A comprehensive review of the many years of Humphreys' spiral concentration was presented by James V. Thompson, now with Kaiser Engineers. The application of some 8,500 spirals now being used was outlined. The majority of the spirals are now applied in the concentration of beach sands although the use on the Iron Range is increasing.

G. W. Govier, University of Alberta, C. A. Shook, and E. O. Lilje, Department of Mining & Metallurgy, University of Alberta, reported on the fundamental study of fine suspensions of magnetite, galena, and ferrosilicon using a rotational viscosimeter. A definite relationship was established between the apparent viscosity and the rate of particle motion.

At the International Mineral Dressing Congress, G. Gerth, German Metallurgist, discussed the influence of ore surface properties particle size and medium size on adhesion losses in heavy-media separation. Flat-shaped minerals exhibited the greatest losses. Medium losses were

also related to medium density and particle size, where a finer medium resulted in the greatest loss.

More interest was generated during the year in the use of spherical ferrosilicon in heavy media processes.

The manufacture of a double-deck coal cleaning table was announced by Deister Concentrator Company. This device was designed for reducing floor space requirements in tabling processes.

The design of heavy-media cones has evidently been improved in regard to startup difficulties. Several plants have been reported operating on day shift only.

DEWATERING: The use of top feed and horizontal filters received increasing attention during the year. These filters are being used and tested for applications where heretofore their application was judged impractical.

Dorr-Oliver announced the use of air lift circulation in its disc filters. These air lifts return classified coarse material from the filter tank to mix with incoming feed.

Agitation prior to filtration has been reported as effective in some applications for reducing the moisture content of filter cakes.

AUTOMATION AND CONTROLS: An automatic titrator for control of lime pH was announced by the Industrial Physics and Electronics Company of Salt Lake City, Utah. This device is being used by the Anaconda Company.

W. C. Knopf and Gene Samsel described the use of the Geiger counter for control analyses of sylvite and feldspar ores. The present practice uses batch determinations but development of a continuous apparatus is under way.

Research Cottrell, Inc. announced complete automation of electrical precipitation equipment. Their system monitors spark gap and readjusts for optimum voltage and power input.

El Control, Ltd. announced the pro-

duction of a bin control apparatus which utilizes proximity switches in the bin. These switches may be wired to activate the conveyor drive motor when desired.

P. J. Stewart described the use of a gamma gauge for determining percent solids in mill pulps including even ferrosilicon media.

The control system in the East Anaconda crushing plant was discussed by Melvin A. Stokke, Anaconda's construction superintendent. The communication system is important to this operation and includes radio, teletype, and telephone. An electronic weighing system is used and provisions are included for stopping equipment when a conveyor belt becomes ripped.

MATERIALS HANDLING: W. S. All-Steel conveyors are presently being manufactured and tested in Great Britain. These conveyors negotiate curves, convey on slopes up to 32° and will handle material with a temperature up to 700° C. Construction is sectional with overlapping curve steel plants.

DuPont and Link-Belt companies conducted tests on light, thin, four-ply nylon conveyor belt, as compared with five-ply cotton belt. The belts had approximately the same strength but greater flexing was possible with the four-ply belt. The largest one-piece conveyor was described by B. F. Goodrich, a 60-inch belt, 1,000 feet long, weighing 22½ tons. This belt is for iron ore in Puerto Ordaz, Venezuela, and will convey 100 tons per minute. Joy announced the marketing of a prefabricated conveyor system which can be put together on the job, including idlers and walkways. Frank C. Stulley of Chain Belt Company described the new form sprag conveyor holdback. Reportedly, this holdback requires less maintenance and has greater dependability than conventional type holdbacks.

MILL DESIGN: E. H. Bronson, Canadian consulting engineer, recounted the

problems encountered in designing foundations for mill buildings on clay and permafrost in the far north.

Bituminous Coal Research, Inc. has developed a new type bin discharge unit for wet coal and other wet materials. This device has no moving parts or vibrators and consists of a double cone discharge opening which is set to maintain the material in an unpacked state in the bottom of the bin.

A heating installation for preventing ore freezing in bins and chutes was described by Bruce E. Allgaier, manager, Idaho Mining Company. This apparatus utilizes a heating cable with aluminum foil for radiation.

GENERAL: More attention was given to dwindling water supplies and to conservation of water in arid mining regions. Tests were started at the Chino, Mines Division, New Mexico, of Kennecott Copper Corporation using cetyl alcohol to reduce water evaporation in reservoirs.

Pierre M. Guy discussed a new theory of sampling based on statistical mathematics. He brought out the point that often sampling systems are more accurate than necessary due to the limits of chemical analytical accuracy. A. H. Blythe described the conveyor belt samples of the Marcona Mining Company in Peru, which cuts a sample from the full width of a 42-inch belt handling 1,900 tons per hour.

The Coulter Industrial Company announced laboratory apparatus for precise particle size measurements in the 1 to 100 micron size range.

The proper use of the yardstick of mill performance, (mill operating records and accounts) was described by Nathaniel Herz, formerly chief metallurgist, Homestake Mining Company.

A method for computing balances in metallurgical circuits by the moment method was presented by E. B. Fitch and E. J. Roberts of Dorris-Oliver, Inc.

After 50 Years of Iron Beneficiation the World Still Copies Mesabi Range Practice



By **STEPHEN E. ERICKSON**

**Director of Beneficiation
M. A. Hanna Company
Hibbing, Minnesota**

The 50th anniversary of iron ore beneficiation was celebrated in August 1957 and most of the beneficiation plants on the Mesabi Range held open house for the public.

As is true at any anniversary time, it is of interest to pause and consider briefly the progress that has been made in 50 years and where the future course of beneficiation is leading, as well as to consider in detail the progress that has been made in the past year.

The first attempt to beneficiate the so-called wash ore was a test made in a log washer in Georgia in 1901. Additional experiments were conducted in 1902, 1903, and 1904. These early experiments demonstrated that it was possible to separate the sand from the ore pieces in the lower grade ores of the western Mesabi Range.

In 1907 the Oliver Iron Mining Company built an experimental mill at Coleraine; during the seasons of 1907 and 1908, large-scale test work was carried on and various machines were tried for the treatment of the overflow of the log washer. A workable flow scheme was evolved and a permanent mill was de-

signed and erected. This mill, which is still operating, was designated as the "Trout Lake Concentrator."

The second plant erected was in 1912 at the Hawkins mine of the International Harvester Company and the third plant was the Harrison concentrator of Butler Brothers erected in 1914. Other washing plants followed in rapid succession.

The original Trout Lake flow scheme was a remarkable achievement because it remained essentially unchanged for 15 years in this and the subsequent plants erected during that time. The only noteworthy change during this period was the introduction of conveyor belts for handling crude ore.

Then bowl-type classifiers replaced the shaking tables. Vibrating screens were substituted for the trommel screens. A combination of vibrating screens and standard Dorris or Akins type classifiers replaced the log washers. Crushers were also installed to break the ore pieces in order to liberate more of the silica sand from the ore pieces.

WASHING: In the first plants, shaking tables were used for recovery of fines but these were subsequently abandoned. Recently there has been a revival of interest in additional recovery from the fine classifier overflows. Most of the plants now use spirals for recovery of fine iron minerals. In the more-or-less standard flow scheme for this purpose, the classifier overflow is

Iron Ore Beneficiation

pumped to desliming cyclones. The cyclone overflow is sent to waste and the underflow goes to spirals. Usually there are only rougher and cleaner spirals and they are used in the ratio of two roughers to one cleaner.

As with other devices, the pocket sizer is no universal cure-all because tests on some types of ores indicate that it offers little or no advantage. It is a useful tool to assist spiral operation and when new spiral plants are under consideration test work should be conducted to determine the applicability of the pocket sizer.

In the early plants, trommel screens and log washers were used to "scrub" or abrade the ore. These were abandoned but recently there has been a revival of interest in "scrubbing." This started several years ago when the abrasion milling process was adopted in a few plants to treat minus- $\frac{1}{4}$ -inch classifier product. In abrasion milling, the ore is ground in a ball mill using a light charge of grinding media. The power consumption is relatively low. With this procedure on amenable ores, the siliceous material is ground finer than the iron minerals so that it can be removed by subsequent washing or classification methods.

Scrubbing of coarse material has been of growing interest recently. A few operators have installed log washers for this purpose but in general they are not favored because of high maintenance costs and because of the difficulty of starting up under load in case of a power failure. The type of scrubber now in favor consists of a cylindrical vessel similar to a ball mill but in which no extraneous grinding media is used. Lifters are used in the scrubber so that the material can be rather violently thrown together for scrubbing and abrasion. The application of rotary scrubbers is so new that many points regarding lifter design, length versus diameter, power, and retention time are still subject to discussion and test work. Even though the theories of scrubbing are the subject of hot debate it appears that the benefits obtainable, in terms of higher concentrate grade, are so well established that scrubbers have been installed or are being considered for a considerable number of plants.

HEAVY MEDIA PROCESS: There has been little change in heavy media practice for several years. Most operators now use somewhat more magnetic separator capacity than formerly. This is because of general elimination of wash water thickeners which means that the magnetic separators receive a greater volume of pulp with a considerably lower content of magnetics.

As the ores have gotten poorer and the demands for higher concentrate grade have increased there has been a tendency to operate the heavy media process at higher separating gravities. This has made it necessary to operate with cleaner media and this too has necessitated increased magnetic separator capacity as well as larger media densifiers.

There is a great deal of interest in the use of spherical media. This material is produced by the Knapsack concern in Germany by atomizing molten ferrosilicon. One company on the Range reports a short plant test with this type of ferrosilicon as being very encouraging with indications of lower media loss, higher separating gravities, and less cleaning of media.

A new vessel for heavy media separation, the "OCC" machine has been undergoing tests on iron ore. This vessel is reported to be in use in a number of coal preparation plants.

In an attempt to obtain cleaner media for plant use and especially in order to reduce viscosity when magnetite is encountered during mining, desliming cyclones have been installed in several plants for pre-cleaning of the ferrosilicon media before the material is fed into the magnetic separators.

CYCLONE PROCESS: Several plants have adopted fluid drives for the cyclone feed pumps so that the pressure at the cyclone feed inlet can be controlled easily at an optimum point. This is said to be quite satisfactory.

Another approach to this same problem has been the use of a constant head tank for feeding the cyclone. This has another potential advantage because it would only be necessary to pump the media to the constant head tank while the ore could be fed into the tank by conveyor or bucket elevator. This should normally give lower power consumption and a lower maintenance cost.

Media for use in cyclone concentration has, in the past, been exclusively the magnetite concentrate produced by the taconite concentrators. In 1957 one of the operators installed a small media grinding unit so that material meeting cyclone operating specifications could be produced by grinding of coarse magnetite. This change in the preparation of the cyclone media was said to have given lower media losses and improved cyclone metallurgy.

SIZING OF CONCENTRATES: There has been a great deal of new sintering capacity installed at the blast furnaces and in order to facilitate the use of this increased capacity the furnace men are now requiring that the concentrates be screened so that the coarse and fine por-

tions can be shipped separately. The coarse material is charged directly to the furnaces and the fines are sintered. Most of the operators have screened some part of the shipments during 1957 and the indications are that this trend will be accelerated. The usual separation size is $\frac{1}{8}$ -inch or $\frac{1}{4}$ -inch. Screening of concentrate introduces the problem of grade because it would be desirable to have both sizes at grade and this means that the grades of two products must be controlled rather than just one.

FLOTATION: A Spiral and flotation plant was installed by Jones & Laughlin Steel Corporation in 1957 at the Hill Annex mine to retreat material from an old tailings basin. The material is mined by means of a hydraulic dredge. The material is then pumped to a cyclone where the minus-150-mesh is removed. The deslimed material is sent to spirals where a concentrate is produced.

The spiral rougher tailing is deslimed in a hydroseparator and then ground to minus-65-mesh. The ground product plus the overflow products are deslimed at 20 microns, scrubbed in flotation machines, again deslimed in cyclones. The deslimed material is conditioned at 70 percent in a rotary drum-type conditioner with sulfuric acid, fuel oil, and a petroleum sulfonate. The conditioned pulp is then floated. Conditioning must be above 70 percent solids or a serious loss of iron occurs. Generally satisfactory results were said to have been obtained at this plant.

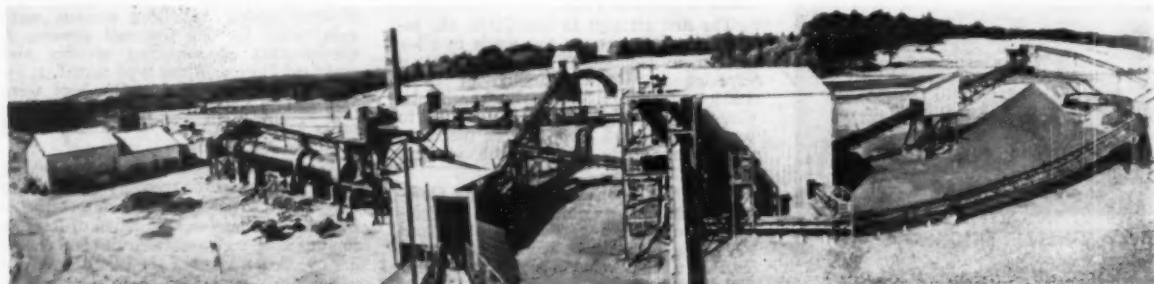
The flotation plants at the Humboldt and Republic Mines of Cleveland Cliffs Iron Company in Michigan operated at full capacity all year.

Plans were also announced by Hanna Coal and Ore Company for construction of a combined spiral and flotation plant to treat the specular hematite ores from the Groveland mine in Michigan.

DRYING OF ORE: Drying of a high moisture crude ore as a beneficiation process was used a number of years ago but was abandoned. This process was revived again at Cleveland Cliffs Iron Company's Ore Improvement plant near Negaunee, Michigan. This new plant started operating in 1957 to treat underground ores by means of drying, crushing, screening, and heavy media separation.

TACONITE CONCENTRATION: Reserve Mining Company's taconite concentrator at Silver Bay completed the second full year's operation. Shipments totaled over 5,000,000 tons of pellets in 1957.

Erie Mining Company's Hoyt Lakes taconite plant was practically completed by the end of the year and most of the plant equipment was being "tuned-up." Full operation at the designed rate of



EAGLE MILLS ore improvement plant of Cleveland-Cliffs Iron Company is first to be built to treat underground ore by three processes. Drying,

screening, and heavy media separation improve physical character and raise iron content of Marquette Range ores.

7,500,000 tons of pellets per year is expected in the first half of 1958.

The taconite concentrator of Hilton Mines near Ottawa in Canada was completed and ready to start operation at the end of 1957.

The flow schemes of all these taconite concentrators are basically quite similar and have been described many times in the recent technical literature.

AGGLOMERATION: As mentioned above there have been a number of new sintering plants placed in operation at the blast furnaces and for this reason a considerable amount of concentrate has been sized before shipment in 1957 so that the fines can be readily sintered and the coarse charged directly to the furnaces.

A considerable amount of development work is still in progress on methods of agglomerating or pelletizing of the fine concentrates produced from the taconite concentrators.

The Erie, Marmora, and Hilton plants use balling drums and a shaft furnace. The Reserve plant uses balling drums and a traveling grate for heat treatment. At Eagle Mills in Michigan, a balling disc is used and the heat treatment of the pellets is on a traveling grate which is operated by updraft circulation of gases.

Oliver Iron Mining's Extaca plant is still testing a standard sintering machine and a rotary nodulizing kiln.

The latest development in pelletizing is a grate-kiln pilot plant which is being operated by Allis-Chalmers. In this process the wet pellets are formed with a balling disc. They are then treated in a short rotary kiln which dries and hardens the pellets. The partially finished pellets are then discharged onto a traveling grate machine where the heat treatment is completed. This method is

claimed to give a superior pellet in regard to hardness and abrasion resistance. The indicated heat consumption appears to be somewhat lower than with other methods of pelletizing.

OTHER PROCESSES: Various methods of concentrating the low-grade finer grained ore reserves are being actively tested and discussed at the present time, but so far there has been no indication of serious consideration of large-scale continuous pilot plant work. Among these processes, the following are of interest.

Reduction roasting followed by magnetic concentration has been discussed for some time and much test work has been conducted. This process has definite advantages, such as the simplicity of magnetic separation, and definite disadvantages such as the high cost of the necessary heat.

Flotation has been tested for non-magnetic taconites and is being used on the favorable specular hematite ores of Michigan. In Minnesota, the earthy character of much of the ore, the slime content, and the variations within a given mine all offer serious obstacles to the process.

A new process that is under intensive study is the dry High Intensity magnetic separation process which has been in successful use in Germany for a number of years. In this process the hematite is recovered by magnetic methods. The ore must be dried, however, and this could be a problem.

There has been a considerable interest in direct reduction processes that would produce a relatively pure iron product. This has some of the same features as the reduction roasting process except that the reduction step would be carried to metallic iron instead of only to magnetite. This means that a final product assaying

about 95 percent iron could be obtained instead of a magnetite concentrate which would assay around 65 percent iron. This process requires considerable amounts of heat and is operated at higher temperatures than the reduction roasting process. However, when all the cost figures are available and when all of the advantages and disadvantages are tallied, it could very well be that a direct reduction process will prove to be the best method of concentrating the lower grade earthy, non-magnetic ore materials, not only of the Mesabi Range but in other districts as well.

FUTURE TRENDS: A modern blast furnace plant is very expensive to construct. With the availability of high-grade foreign ores and taconite concentrate pellets, it has been proven that by a proper selection of the iron ores for the blast furnace charge, increased furnace productivity can be obtained at relatively low cost. Therefore, there is more and more demand for materials that are high grade and that have the most advantageous structure. This means that more attention is being given to beneficiation methods in all of the iron ore districts.

Even in Labrador where there are large reserves of desirable direct shipping ore, the past year saw the operation of a pilot plant for spiral concentration of the lower grade specular ores. These ores are readily amenable to grinding by means of an Aerofall mill and can be readily concentrated to a very high-grade product by means of spirals.

There is reason to believe that in the future all materials charged into a blast furnace will be beneficiated, either to improve the physical structure or to improve the chemical composition or both.

New In Europe—Underwater Screening; Magnetic Separation, and Rock Grinding

Metallurgical development highlights in Europe in 1957 centered on: (1) Underwater screening of fine pulps; (2) efforts to develop high capacity magnetic separators; and (3) a reappraisal of all types of grinding.

To this list of metallurgical events must be added the International Mineral Dressing Conference held in Stockholm, Sweden in September. Reference is made to some of the outstanding papers at this conference in the other sections of this Technological Review.

UNDERWATER SCREENING: The necessity for wet screening of fine materials is of ever growing importance; however, the difficulties are increasing as the material gets finer and capacity decreases. Now, the modern underwater screen is able to operate properly in the sizing range between 0.75 and 10 millimeters at throughput rates per unit of screen surface that are three to four times higher than those of standard screens. This may be the reason why mineral dressing engineers from many countries paid so much attention to the Klockner-Humboldt-Deutz opposed-vibrating underwater screen which was exhibited at the German Industry Fair in Hanover in 1957.

With this screen two masses vibrate in 180° phase opposition, namely, the screen box and the much heavier opposite-acting mass—the filled water funnel with the attached supporting structure. The latter rests on soft rubber mountings. Thus, vibrations cannot be transferred to the building structure. The rigidly coupled rod-drive acts on either side of the screen box; and the latter, in turn, is linked to the funnel by Lignostone springs.

The trough-shaped middle-piece of the screen surface (for finest size screening usually bar-screen surfaces are used) lies approximately 12 inches below the water level whose height is adjustable by an overflow weir. Two ends of the screen surface protrude above the water line so that the discharge side slowly ascends and is of such length that effective dewatering of the screen-oversize is ensured. The undersize sinks into the funnel at a quick rate which is due to the light vibratory motion of the funnel. At the lowest point the fines leave the funnel through an orifice of adjustable width. The adjustment of this orifice is determined by the volume of water that is caused to flow through the upstream-channel, on the rear side of the funnel, to the overflow weir where it is discharged.

This water current can be so regulated that either the overflow is practically free of solid matter or a secondary desliming effect is brought about.

The action of the underwater screen is marked by the pulsating motion of the water. Therefore only very fine particles that are so difficult to separate in normal dry screening operations are first washed out of the feed material. In the water bath no capillary effects can take place within the feed whereas normal spray-screening is strongly impeded by such capillary effects. The sizing process does not require much water. This is mainly due to the high rate of sedimentation of the screen undersize, or the washed-off finest-sized matter, respectively.

Underwater screening has a broad field of application. Fine classification is performed with a high degree of separating accuracy and throughput rates. For instance, with 1-millimeter-wide bar-screen apertures the hourly throughput capacities of 3 to 4 cubic meters per square meter of screening surface are obtained. With 6 millimeter round-hole screens, approximately 15 cubic meters per square meter.

Underwater screening has been effective in European and United States heavy media plants first, to remove any slime or fine material in the feed, and second, to thoroughly wash the products free of all entrained media. Excellent results have been attained, even for washing porous and pitted material from which the media can be washed only with difficulty.

European Metallurgy

By the end of 1957 the underwater screens in sizes up to 55 inches in width and 13 feet long were being used in five countries for more than 25 different applications. Materials being screened include: placer gravel, German iron ores, diamond-bearing rock, fluor spar, sand and gravel, and coal.

MAGNETIC SEPARATION DEVELOPMENTS AND TRENDS: Efforts to develop magnetic separators with high capacity for concentration of both weak and strong magnetic fine grained iron ores was the dominating trend in metallurgy in Scandinavia and Western Germany in 1957. The reason—it will be necessary to treat larger tonnages of the low-grade, fine-grained and intergrown iron ores of the countries.

In general, strongly magnetic fine-grained iron ores were almost exclusively treated in wet, low-intensity, pickup separators. Dry methods are sometimes used for retreating dried concentrates produced by wet separators to remove undesired minerals of lower magnetic susceptibility.

Laboratory tests in Finland proved that dry magnetic separation could be improved if, during grinding or drying, reagents are added to the ore to impart to the ore particles a mutually repelling effect.

Scandinavia makes broadest possible use of the more expensive but fool-proof permanent magnetic separator for concentrating magnetite ores. Much work is being done to increase its field intensity by employing magnetic materials with improved properties and by trying to pack as much as possible of such material into the drum. With the Laurila separator the magnetic field can be regularly weakened during operation of the machine; this may be of advantage if impurities of somewhat lower magnetic attractability are to be removed from magnetite concentrate.

The new Humboldt wet drum separator (1,000 millimeter diameter and 1,800 millimeter drum width)—supposedly the largest of its kind in Europe—was installed in a number of mills. Energy con-

sumption of its magnet system which is equipped with five alternating poles, is 6 kilowatts under conditions of continuous operation. When treating beach sand in a Canadian plant, this separator reached an hourly throughput rate of 90 tons. With two separations and consecutive wet mechanical removal of an ilmenite-enriched product, a 65 percent Fe concentrate is recovered from sands containing between 3 and 5 percent magnetite.

In a German sink float plant for brown iron ore this type separator recovers 14 tons per hour of ferrosilicon.

For treatment of weakly magnetic iron ores (hematite, brown iron) in high-intensity magnetic fields—a problem upon which much attention is being focussed—two events seem to be of far-reaching importance:

The high-intensity dry magnetic separator developed by Goltz (Salzgitter) will soon be put into operation in a plant of the Hüttenwerke Peine-Ilse. This separator has two magnet rolls each of 800 millimeter width and operates at very high field-intensity. Its throughput rate is reported to reach 10 tons per hour. Tailing of less than 5 percent Fe is said to have been produced after several magnetic retreatment stages. In order to avoid contamination of the concentrate by entrained waste dust, an indraft air current is maintained in the separation gap.

EUROPEAN VIEWS ON DRY AND WET GRINDING: No basic changes occurred in grinding practice in Europe during 1957. The long tendency to impact crushing continues. Aside from special cases, wet grinding in rod or ball mills predominates.

However, testing, calculation, and evaluation of both wet and dry grinding received, and will continue to receive, the attention of European metallurgists. Here are current views of a number of metallurgists on the subject:

The costs of the grinding process proper—as confined to the mill unit—are of the same order for wet and dry grinding unless the cost of electricity is exces-

sive. (Under comparable conditions the power demand of wet grinding is lower, whereas with dry grinding the rate of wear on grinding media and mill lining is lower thus resulting in reduced maintenance cost).

Today wet operating classifiers are, as a rule, still more efficient and require less power and space than dry classifying equipment of comparable capacity so that under the common conditions of closed-circuit grinding economy swings to the side of wet grinding.

Where wet feed is to be ground or the ground product—as is usually the case in ore dressing—is to be wet treated subsequently (wet gravity concentration; flotation; wet magnetic treatment), wet grinding is preferable. Moreover, as recent scientific findings seem to indicate, the addition of surface activation reagents during wet grinding may raise its efficiency so in future this may also favor wet grinding.

In the relatively few cases where the ground ore is to be dry-processed, however, it must be carefully examined whether dry grinding is to be preferred. This also applies to one of today's major ore dressing problems, i.e. the beneficiation of lean finely intergrown iron ores containing weakly magnetic minerals that are to be concentrated on dry magnetic high-intensity separators.

Theoretic considerations on the mode of operation, as well as some reports on practical experience gathered with rock grinding units in ore dressing plants, seem to indicate that under certain conditions the operating cost of plants can be substantially lowered by the application of dry operating air-swept crusher-mill combination.

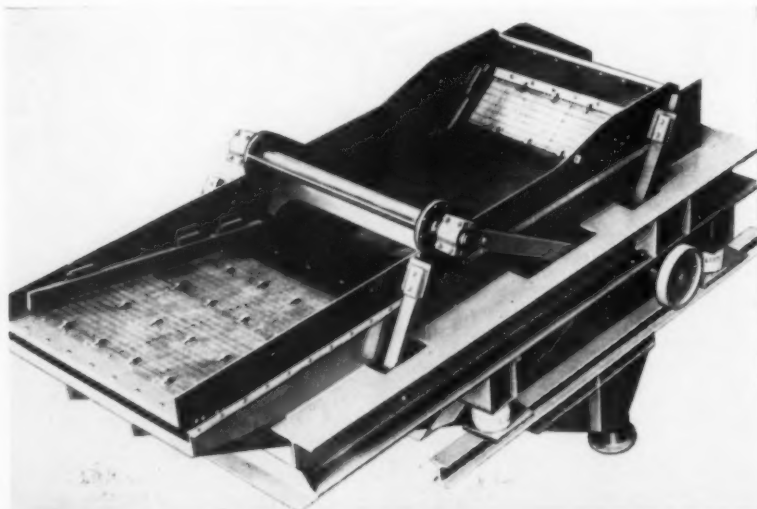
The outstanding advantage of such is its high reduction ratio which permits the comminution of coarse feed material to considerable fineness in one pass through the mill. Therefore, against multi-stage reduction in conventional crushers and mills of lower reduction ratio, the use of rock grinding mills may often lead to substantial savings in investment and operating costs for crushers and grinding mills and their auxiliary equipment, as well as to lower space requirements, simplified flow-sheets, and plants that are easy to supervise. These advantages will become more tangible as the throughput rate of the plant increases.

If the kind of ore and the requirements as to the recovery rate permit, finest dust particles can be removed by air separation from the ground product before it undergoes wet treatment. This will have a favorable influence on the sludge problem which often is a source of serious trouble.

Under such concepts the application of these mills for large-scale reduction of low-grade ores, particularly lean iron ores which are to be dry-magnetically concentrated, seems to involve essential advantages. This, however, is an acute problem which in the future will even increase in importance.

Much more practical data on as many different ores as possible will be required in order to bring out clearly the advantages on the one hand, and, on the other hand, the limitations as to the range of economic application of this interesting crusher-mill combination.

In spite of the existing uncertainty, however, some large German companies are reported as seriously considering the problems of using rock grinding mills.



UNDERWATER SCREENS developed in Germany have found wide application for screening iron ores, diamond bearing rock, fluor spar, and other minerals in many countries.

Sink, Drift, Raise, and Muck Faster With Better Planning and New Machines



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Speed makes money in underground mining today. Faster development cycles mean higher tonnage rates which in turn makes costs lower.

Operators are designing new machines and coordinating mining plans to keep those machines at the face more hours per shift. The following results clearly indicate that underground miners are doing a remarkable job.

SHAFT SINKING: Outstanding progress in circular shaft sinking has been achieved in South Africa. Recent mechanization of their sinking methods has resulted in establishing new world's records. The unique feature of their sinking method is simultaneous sinking and concreting. A multi-deck Galloway stage is used to place concrete forms and to pour concrete while a crew in the bottom proceeds with drilling or mucking in the sinking operation.

A record of 834 feet of sinking was achieved in 30 days with an excavated diameter of 30 feet. In September, 1957, Free State Saaiplaas Gold Mining Company, Ltd., a member of the New Consolidated Gold Field Ltd.'s group established this record in the biggest shaft in South Africa, if not in the world. The finished diameter, inside of concrete, is 27.5 feet.

At Saaiplaas, three precementation boreholes were put down around the perimeter of the shaft and 30 feet away from it. They were drilled to a depth of 2,240 feet and a total of 6,755 pockets of quick-drying cement injected. The success of this was shown by the interception of a number of concrete-filled fissures in the course of sinking.

The planned depth is 6,400 feet. One key to the success is the tremendous size of the equipment used. The sinking stage weighing 21 tons has three fixed decks 15 feet apart. A modified Vlakfontein-type cactus grab is used for mucking. The grab weighs four tons and has a capacity of 20 cubic feet—equal to about one ton of country rock—and is capable of loading up to 300 tons an hour. The broken muck is loaded in 185-cubic-foot buckets (approximately 9.25 tons). Three

buckets are kept in constant operation during cleaning operations, with two on the bottom and one in transit. The best loading performance was 28 buckets an hour in shale and 18 in hard rock.

Drilling is done with 26, hand-held, three-inch sinkers, weighing 80 pounds each, using tungsten carbide tipped steel in 72 inch and 110 inch lengths. In the Karroo shale, 146 holes in concentric circles were drilled in each round. In the harder ground of the Ventersdorp lava, 170 holes were required. A hole director is used to accurately position each hole.

Concrete lining proceeded simultaneously with sinking and during the month 810 feet of this was completed. Pipelines carried 4,600 cubic yards of premixed concrete down to the sinking platform during the month.

Several new shafts—both vertical and sub-vertical—are in progress in South Africa. Western Holdings, Ltd. has started on a 24-foot-diameter main hoisting shaft. Recent developments have been the Blair stage hoist which is designed for sinking to a depth of 10,000 feet. Another Blair innovation is a two-part line used on skips, which will permit hoisting ore from 10,000 feet in one lift.

A recent experiment in skip hoisting was quite interesting. Normally the steel "hat" guides are supported by steel or concrete dividers every 15 feet. Hoisting speeds vary from 2,500 to 4,000 feet per minute. In this test guides were supported, first at 30-foot centers, then at 60-foot centers. There was no significant movement of the guides at 30 feet and the deflection amounted to only 1/4 inch when guides were fastened at 60-foot centers. The trend is toward greater distances between guide supports. In the future it may be possible to eliminate all steel members in the shafts and use wire rope guides for skips and cages.

Rieback Gold Mining Company, Ltd. in the Orange Free State is putting down a 26-foot-internal-diameter shaft with a planned final depth of 5,800 feet. This project also involved precementation and, in addition, equipping with buntons, guides, and a brattice wall simultaneously with the sinking and lining.

The Hartebeestfontein Gold Mining Company, Ltd.'s No. 2A sub-vertical shaft is collared at the 3,500-foot level and will be sunk to approximately 7,000 feet. The internal diameter is 24 feet 1 inch. An unusual feature is the nine-deck sinking stage. The total length of the structure is 60 feet. It has three platforms and six catwalks. A 20-cubic-foot-capacity mechanical grab is being used for cleaning out, and all broken rock is removed to surface by way of No. 2 shaft. An interesting feature of the rock transportation system is the 42-inch conveyor belt which carries muck from the sub-vertical shaft to the skip loading bins at No. 2 shaft at a speed of about 412 feet per minute.

A major project is under way at Western Deep Levels Limited in South Africa. Two systems of twin shafts, each system consisting of a 26-foot-internal-diameter hoisting shaft and a 20-foot-internal-diameter ventilation shaft, have been started. The main and ventilation shafts of each system are 200 feet apart from center to center. The two systems

are about 8,500 feet apart. The ultimate depth of these shafts will be 6,000 feet.

Eventually a deep level system will be collared at the 5,800-foot level and sunk to 10,000 feet. These sub-vertical shafts will be 24 feet in diameter for hoisting and 18 feet in diameter for ventilation.

At present surface installations are completed for sinking operations which started in early 1958. An important development here is the use of concrete head frames. The two ventilation shafts have circular concrete head frames 73 feet high, which were poured continuously with slip forms. Square concrete head frames have been constructed for the hoisting shaft.

Four precementation holes are being drilled around the periphery of each shaft, each hole being collared 30 feet from the shaft center. Quick-drying cement is distributed to the drilling rigs through individual feed-pipes from a central mixing plant. Six injector pumps and three double-tank mixing bins are housed in each of two cement distribution sheds.

It is planned to drill 90 7-foot holes per round in the ventilation shafts and 120 holes per round in the hoisting shafts. Of the four shafts, the two main shafts and one ventilation shaft are equipped for mechanical mucking; the other ventilation shaft will be hand mucked. The three grabs supplied to Western Deep Levels by Sturrocks Ltd. are designed on the same lines as the one which was instrumental in setting the world record at Free State Saaiplaas. All have a capacity of 20 cubic feet and all are fitted with a by-pass on the air cylinder, which allows the operator greater control of fine movement.

A new development has been made on the sinking stages for use in the mechanically cleaned shafts. They are seven-deck Galloway stages, 80 feet high, designed so that the bottom two decks of each stage are capable of independent movement. The bottom two decks from which the mechanical mucker is suspended can be lowered to the desired mucking position near the shaft bottom, while the remaining five decks are fixed in place for concreting operations. This again, shows careful planning to permit simultaneous mucking and concreting operations.

At Homestake Mining Company, Lead, South Dakota, a 19-foot-diameter circular shaft is being raised from deep levels and sunk from surface. Drifts were driven to the shaft site on five levels between the 2,000- and 5,000-foot levels. Pilot raises 7 by 9 feet were driven vertically approximately 900 feet to connect the drifts. The one above the 2,000-foot level was driven 935 feet before ground conditions made it advisable to stop. This left 970 feet to be sunk from surface. A six-machine jumbo was used for drilling a 90-hole burn cut round. Holes were drilled with 9.5-foot-long, 3/4-inch hex steel, with 1 1/2-inch tungsten carbide insert bits. A single steel change was used with the long automatic feed machines. A model 630 Eimco rocker shovel is used for mucking. The crew installs steel sets and 14 gauge corrugated lacing after mucking. When five sets, or 50 feet of steel, have been installed, concrete is poured. Air-intrained concrete is trucked from the company mixing plant to the shaft collar.

The M. A. Hanna Company is sinking a new shaft in the Mineral Hills area, Iron River, Michigan. The shaft is 20 feet inside diameter, and will be 2,600

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feet in depth. The circular section was chosen in order to keep the shaft as dry as possible for the friction-type hoist system. It is being sunk by Walsh Construction Company. They are using a specially designed four-machine jumbo, Eimco 630 mucker, and 30-foot forms which are suspended in the shaft and will not come out until the job is completed. Steel sets are being carried down as sinking progresses. The sets are on 10-foot centers and three sets are usually installed at one time immediately following a concrete pour. When sinking operations are completed, a Koepe-type hoist will be mounted in the head frame. Future rock hoisting skips will be of 15 ton capacity.

The Anaconda Company in Butte, Montana is planning a 24-foot-diameter circular shaft at the Ryan Mine. This shaft will have hoisting facilities for 15,000 tons of ore per day using four 15-ton bottom dump skips. The shaft will also accommodate a double-deck service cage with a floor area 5.25 by 13.0 feet. A second circular shaft is being currently sunk in Butte. The Modoc ventilation shaft has a 16-foot-diameter inside of concrete. A two-deck sinking platform is being used.

In Canada, the Potash Company of America Ltd., is sinking a 16-foot-diameter shaft near Saskatoon Saskatchewan. This Company is now sinking a large production shaft to a depth of approximately 3,500 feet. They are using a sinking stage very similar to the Galloway stage used in South Africa. Production will come from "potash beds" at a depth of 3,100 feet. The mine plant has been designed for a capacity of 4,000 to 4,500 tons of ore per day, or approximately 1,500,000 annually. Provisions have been made for a substantial expansion, should this be warranted at a later date.

Ground conditions in Saskatchewan are difficult, with two distinct zones requiring freezing to sufficiently stabilize the ground. One is a glacial till and the other, a sand at approximately 1,300 feet containing water under 1,500 pounds per square inch pressure. P.C.A. has sunk freeze holes from surface to 3,000 feet and, with an elaborate refrigeration system, has frozen the ground through which the shaft is being sunk.

International Minerals and Chemical Corporation of Canada, Ltd. is sinking an 18-foot circular shaft near Esterhazy, Saskatchewan. They expect to reach the "potash beds" at 3,100 feet and will bottom the shaft at 3,500. Utah Construction Company is the contractor and they are using the Cryderman mucker. In this case local freezing is being used successfully to stabilize the unconsolidated glacial till and water-bearing sands.

In England, two 24-foot-diameter shafts are now being sunk approximately 800 feet to coal beds lying under water-bearing alluvial deposits. These shafts are located at the Lea Hall Colliery, approximately eight miles northeast of Cannock. This company is using freezing techniques in order to stabilize the water-bearing strata. The work of lining 800 feet of a 24-foot circular upcast shaft was recently completed. Thirty-four bore holes were drilled around the periphery of the shaft. For a period of approximately a year and a half, 27,000 gallons of cold brine were circulated per hour at a temperature of minus-2° F. When freezing was completed, the shaft was sunk to its ultimate depth through the ice wall. High strength concrete, having an average compressive strength of 6,800 pounds per square inch, and a maximum slump of 2½ inches, was poured as a monolithic structure. Experience indicated that a strong and water tight lining of mass concrete can be installed in a shaft sunk by the freezing process. The heat generated by setting concrete does allow the initial "set" to take place before the frost returns to the concrete to retard the curing. The delayed shrinking takes place eventually in the thawing out, and can be dealt with by injection. Minute shrinkage cracks appeared at approximately 30-foot intervals. A flow of 30 gallons per minute was experienced through these cracks. Water-bearing strata had pressures as high as 300 pounds per square inch. Liquid cement was injected behind the concrete lining in order to seal off the flow of water. When this process was completed, the total leakage was ¾ gallon per minute, most of this water was coming through cracks in portions of the shaft where injections of liquid cement were not made.

RAISING: A method of driving a vertical raise by use of a cage has been used at the Cary underground iron mine of the Odanah Iron Company, Pickands Mather & Co., managers, Hurley, Wisconsin. This method is similar to that used previously at Tennessee Copper Company. The Cary mine is deepening the mine shaft from the 34th to the 37th level, approximately 600 feet. Crosscuts were driven to the center line of the shaft on the 35th, 36th, and 37th levels which are at 200-foot vertical intervals. All of this work was done in granite, and the majority of the openings were not timbered. The raising method, in general, consisted of a 3½-inch diamond drill hole between levels through which was passed a hoisting rope to raise and lower a light cage. The cage consisted of a steel framework covered with wire mesh of two-inch openings. It was circular, 4.5 feet in diameter and 7.0 feet high. At the start of the cycle, a hoisting rope was lowered through the diamond drill hole to the level below. The miners then attached the ¾-inch non-rotating rope to the cage which was pulled into position for hoisting. The drills, steel, etc., were loaded on the cage, and air and water hoses and signal cable attached, and hoisting to the face begun. As the cage was hoisted, the walls were examined and trimmed if necessary. When the face was reached, it was examined for loose rock and trimmed from within the cage. The cage was then spotted about 7 feet from the face, and one of the top sections removed to afford access to the top of the cage. The cage was then spragged in place to prevent it from rotating and drilling was begun. The raise was kept 6 feet, or a little larger, in diameter, requiring 18 to 20 holes, the diamond drill hole serving as the cut. When drilling was completed, the round was loaded, the cage lowered, and the rope and cage removed from the raise. Blasted rock was removed from the bottom of the raise by means of a scraper and 25-horsepower electric slusher. The rock was scraped up the ramp and loaded into 75-cubic-foot cars. On a three-shift-per-day basis, with two miners and a hoistman on each shift, the best footage for one day was 15.0 feet, and the overall average was 10.4 feet per day. When raise was completed, it was enlarged and stripped to the full shaft size.

TUNNEL DRIVING: A world record for tunnel driving was established by Doornfontein Gold Mining Co. Ltd., in South Africa. A staggering 1,903 feet was driven in a 9- by 10-foot heading in 26 days. A 32 hole drag cut was drilled with air leg machines, the average footage broken per round was 7,461. Average daily advance was 73.2 feet and the best day's advance was 81 feet in 11 rounds. The average cycle time was 2,456 hours and the best cycle was 2.0 hours. An Eimco model 21 loader was used. Doornfontein is now tackling a twin haulage drive and they are aiming at 3,000 feet in 30 days.

During September 1957, the Utah Construction Company, contracting for Kennecott Copper Corporation, achieved 1,090 feet of advance in a concreted railroad tunnel being driven at Bingham Canyon, Utah.

During the same month, Anaconda's Andes Copper Mining Company advanced a 15- by 17-foot heading 1,405 feet at the new El Salvador mine in Chile. This railroad tunnel is being driven



CHILEAN TRAIN LOADER uses an overshot loader to muck directly into three car train which holds complete round of broken rock from 8-foot round in 15 by 17 foot heading.

Underground Mining

using a "train loader" or "integrated slusher train." This type of equipment was first used at the Boliden mine in Sweden, and later adapted for use at San Francisco Chemical Company near Montpelier, Idaho. These installations utilized cars with capacities ranging up to approximately 125 cubic feet. The Chilean train loader utilized three 828-cubic-foot cars. An Eimco 105 overshot loader is used to muck the broken rock into a hopper at the heading-end of the train. A 78-inch scraper is used to slide the rock out of the hopper and distribute it along the train of three cars. The scraper slides along grizzly rails at the top of the cars allowing the rocks to fall through the grizzlies into the cars, thus distributing the rock along the length of the train. The Ansoco scraper hoist has remote controls located adjacent to the hopper so that the operator has excellent visibility and can coordinate the movements of the scraper with the action of the Eimco 105. A Joy 50-horsepower, high torque, high slip, slusher hoist is mounted at the portal end of the train. The three-car train was designed to hold all of the rock from an 8-foot round in the 15 by 17 foot heading. If rock is stacked above the grizzly elevation, it is possible to load a 12-foot round.

Important considerations with this type of equipment are: to provide sufficient car volume to hold the entire muck pile so that no car changing is required; to plan the scraping system so that muck can be distributed along the train more rapidly than the rocker shovel can muck it into the hopper. Mucking time with this equipment averages approximately one hour and 15 minutes, while the best time has been 50 minutes. The railroad cars adapted for the train loader at Andes were rated as 45-ton, bottom dump cars.

Recently Oscar Cheff developed a train loader for an 8- by 8-foot heading using side dump cars. An Eimco model 12 was used to muck rock from 4-foot rounds into the train loader in 20 minutes. These headings in water tunnels at the Canyon Ferry dam in Montana were advanced at rates averaging better than 40 feet per day. A round-in round-out cycle time was established at approximately two hours.

In Butte, research work is progressing on train loaders to be used on 18-inch and 36-inch gauge track. These units will be used for vein mine and block caving mine development. An important development in these train loaders is a device designed to distribute rock while the train loader is being operated on a curve. The train loader system of mucking eliminates car changing in the heading, and as a result usually cuts mucking time in half.

A very important development, of the train loader type, is the BZ 35 manufactured by Salzgitter in West Germany. This machine utilizes a chain conveyor to distribute the rock the length of the train. A rocker shovel loads muck continuously at the rate of 107 cubic feet per minute. The rock is discharged onto a loading conveyor which in turn discharges into the first car where a pneumatic pusher compresses the loose rock. The unique features of this train are the open ended cars, coupled together by articulated joints, and the double strand scraper chain installed in the bottom of the cars. A 40-horsepower chain driving motor is located under the last car of

the train. When the first car has been loaded with rock to its full cross section, the chain conveyor is activated, moving the rock load a few feet along the train, and providing a void into which the loading conveyor discharges rock. The rock is gradually conveyed along the length of the train at the same rate that the rocker shovel loads the train. Twenty-two open ended cars make up the train which has an overall length of 132 feet and a total capacity of 60 tons or 1,250 cubic feet. It is claimed that broken rock up to 2.0 by 3.3 feet in size can be handled. A mine locomotive of nine to 12 tons with a traveling speed of 4.3 to 6.2 miles per hour loaded, and 6.2 to 8.7 miles per hour empty, is utilized for hauling the BZ 35 train. Bends of 66-foot radius can be negotiated when traveling, although loading and discharging has to be confined to straight track. The standard model is designed for use with 24-inch gauge track, but in special cases provision can be made for 21½- to 36-inch tracks. The height of the standard cars is 5 feet 3 inches, while the maximum width is 3 feet 11 inches. The main application of the bunker train obviously is in rapid tunnel driving. It has been used for hydroelectric tunnels in Switzerland.

TRACKLESS MINING UNDERGROUND: The increased use of trackless equipment in metal mines is an important trend. One of the first applications of the Eimco 630 rocker shovel was at the Indian Creek mine of the St. Joseph Lead Company in Missouri. There, this tractor-mounted shovel loaded special six-ton trucks. This idea was taken to Africa, where in early 1957, trackless mining began underground at Mufulira, Copper Mines Limited. Previously, rail mounted loaders were used to move the broken rock into Granby cars. This system meant that the track layer had to follow immediately behind the miner, laying his track at high speed so that the heading could be approached without delay. Now with the Eimco 630 and Joy shuttle cars, the trackless equipment can be taken straight to the scene of operations and the track laying for permanent use can be done with more precision at a later date. The Eimco loader and a Joy shuttle car require only

three African workers—two operators on the machines and a hose-boy. In an eight-hour shift, it is possible for this crew of three to move 300 tons of broken ground or 100 tons for each man.

Trackless mining methods that have become standard in the coal mines of the United States have found their way to iron mining in Sweden. At Kiiruna-vaaara, Joy 18 H.R.2 loaders are used in combination with Joy shuttle cars. This combination, operated by two miners, has a capacity of approximately 600 tons a shift. The rock is transferred into an ore pass, dropping to a main haulage level. From these ore passes, the ore is discharged in three-cubic-meter and seven-cubic-meter Granby cars, and hauled to one of four crushing stations. The crushed ore passes into underground storage bins from which it is measured and automatically loaded into 20-ton skips. Hoisting takes place through eight shafts, each of which has a 20-ton bottom dump skip operated with a counter weight and powered by a four-rope ASEA friction-type hoist. Each hoist has a capacity of 500 tons an hour and the whole central plant has a daily capacity of 50,000 tons.

Interesting improvements in trackless equipment have been made by the Montevecchio Company, which operates lead and zinc mines in Sardinia. Prime instruments in a program which saw output nearly doubled were two machines developed by Atlas Copco of Italy, at the request, and to the specifications of the mining company. The cut and fill method of mining is used since subsidence is a problem. A large sink-float plant at the mine site provides a properly sized waste which is delivered to the stopes by chutes. A rubber-tired hauler was designed to place this fill underground or to dump ore down ore passes. This compressed air operated vehicle is now made in two sizes: the standard two-cubic-yard model, which works in the normal stopes, and the one-yard machine which works in narrow drifts and stopes and performs final cleanup.

The next step in the development was a self-loading transported. The loader-hauler is a multiple use machine. It loads ore from the muck pile, transports



TRACKLESS MINING gains in favor for hard ore. This electric powered loader teamed with electric driven shuttle car handles hard heavy abrasive iron ore at major mine.

Underground Mining

it to the ore pass, and dumps. The larger of the two Atlas Copco models, the T4G, now in operation at Montevecchio, has an actual capacity of 2.14 cubic yards. The loading bucket cleans the floor and is powerful enough to penetrate well into the muck pile for each load. Traveling speed of the machine is 4½ feet per second. With a hauling distance of 72 feet between the muck pile and the ore pass, the machine loaded and dumped 54½ cubic yards per hour. This machine has allowed a greater spacing of ore passes, up to 328 feet. The model T2G, also going into use at Montevecchio, is a smaller version of the prototype with a one-cubic-yard hopper. It performs best where the floor is irregular.

UNDERGROUND CONVEYORS: Recent developments of Goodman rope belt conveyors have made these lightweight, economical installations more widely used underground. Their simple construction, with support from either the back or the floor, makes them a versatile addition to a mine gathering system. An installation is currently being designed and tested for the Tennessee Coal and Iron Company. This conveyor is to handle a maximum lump size of 20.5 inches. Belt speed will be 350 feet per minute and belt width 42 inches. Maximum lump weight will not exceed 1,000 pounds. The belt conveyor is to take the surge of a 13-ton shuttle car in a minute to a minute and a half discharge rate. Other installations of this type are at Cleveland-Cliffs Iron Company and at Steep Rock in Ontario. The development of an extensible belt conveyor for use behind a continuous miner is also of significance in underground materials handling. These units can be extended 100 feet without interrupting the flow of material.

Armored conveyors are now finding acceptance in hard rock mining. Units made by the Herold Manufacturing Company of Scranton, Pennsylvania, have been installed by Cleveland-Cliffs Iron Company and Steep Rock Iron Mines Limited. The armored conveyors are handling iron ore which weighs approximately 160 pounds per cubic foot when broken and the lumps range in size up to 3 feet. The ore is moist to wet and is

moderately abrasive. These chain type conveyors move the ore in a trough. A typical installation has a conveyor length of 250 feet and is powered with a 100-horsepower motor. It has a rated capacity of 200 tons per hour at an operating speed of 85 feet per minute. Most of these installations are used for moving cave rock from finger raises or from scam drifts to cars. These units have been installed where slusher hoists and scrapers have normally worked in the past. The economical scraping distance in block caving installations is normally about 125 feet. The importance of the armored conveyor lies in the fact that they are practical at distances of 250 feet and provide a continuous flow of rock.

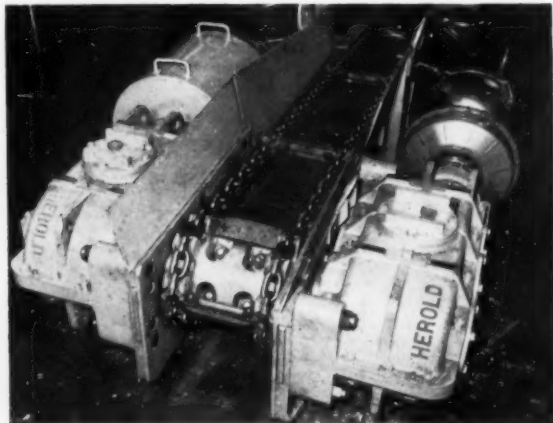
VENTILATION: Significant developments have been made by the Anaconda Company in the field of dust collection. A compact wet impinger type dust collector, known as the "Microdyne," was pioneered by the Anaconda Ventilation Department and is made by the Joy Manufacturing Company. The unit is made up of three double walled cylindrical sections with a fan mounted end-to-end so that the resultant configuration is a smooth cylinder. The first section is a cleaner section; it contains a water spray and an impingement screen assembly. The second section is a water eliminator section which is an axial type cyclone containing turning and straightening vanes. The third section is a transition section to accommodate the Joy axial flow fan. This dust collector is so small that it is often possible to mount the entire unit in the duct line. The dust laden air enters the collector at the cleaner section under suction from the fan. The air passes through the sprays and then through the cleaner section. The geometric configuration of the screen is such that there is no straight line path for the air to pass through. It must turn in order to pass through the screen. The dust impinges upon the fine wires of the screen due to its own inertia. At this point the water sprays perform a dual role. One is to wet the screen and catch the dust, and the other is to keep the screen flushed at all times to prevent clogging. As the water droplets leave the screen, due to the air flow, the effective mass of the dust particles is in-

creased many times since dust is encased within the droplets. The water droplets then enter the cyclonic separator and are thrown to the periphery of the collector because of the centrifugal force field generated within. Around the circumference of the water eliminator are many louvers through which the water passes and is subsequently drained into a water sump at the bottom of the water eliminator. The sump is provided with two discharge pipes, from which the resultant slurry can be drained or pumped away. The cleaned air passes from the water eliminator through the fan and out of the unit. The "Microdyne" is usually fabricated from stainless steel and has no moving parts except a standard axial-vane fan. The units range in capacity from 2,500 to 48,000 cu. ft. per minute.

At Nchanga Consolidated Copper Mines, Ltd. in the African Copper belt, two modern electrostatic air filters have recently been installed underground. One is installed on the 970 level. The more recent on the 1,500 level. About 50,000 cubic feet per minute of air is sucked through the new precipitron by a 50-inch diameter fan, which is driven by a 50-horsepower motor. The installation consists of three major parts—the ionizer, the dust collector cell, and the power pack. The ionizer comprises a number of grounded tubes between which are fine metal wires charged at about 13,000 volts dc. The high potential difference between the fine wire and the grounded tube surface causes a strong electrostatic field to be set up across this space. When a dust particle, carried by the air stream, passes through this space, it is met by a stream of ions traveling outward from the ionizing wire. It is immediately charged and is ready to be deposited on the collecting surface. The collector cell is a number of flat, parallel, vertical plates, one set of which is grounded, and the second set charged to about 6,000 volts. The charged dust particles pass through the plates and are driven to the grounded plate to which they stick until removed during cleaning operations. The plates are cleaned by a jet of water once a week and are dried by compressed air.



INCLINED SHAFT was mucked with this electric powered loader during sinking. The same machine was then used for ore loading in stapes.



ARMORED CONVEYORS are now used for moving iron ore to raises or cars from finger raises underneath block caved stapes.

Open Pit Mining Takes Transportation Planning With Larger Machine Units

As open pits get larger and deeper the stripping ratio goes higher—for iron, copper, and other metals. Machinery companies and operators have done a spectacular job in building and using new and larger machines to make this possible.

New drills and new blasting agents produce the broken rock. From the muck pile it's a matter of transportation—big fast coordinated transportation—to complete the mining cycle. Here are current developments and trends:

ROTARY DRILLING: With the trend to fertilizer grade, free running, explosives, has come the demand for larger diameter blast holes and greater hole spacing. The result has been less footage of hole drilled and a concentration of explosive force at the hole bottom. Rotary drilling is rapidly replacing churn drilling as a means of boring blast holes, because of increases of two to four times the footage of hole per shift and the consequent reduction in drilling costs. Of basic importance is the rotary bit design and the quantity of compressed air provided to remove cuttings from the hole. A tremendous variety of bits adapted for all types of ground conditions, from soft to hard, are now available. These range from "drag" or "finger type" bits for use in soft formations to tungsten carbide "tri-cone" bits for hard formations. An important factor in bit life, is the removal of rock cuttings from the hole as large particles. To accomplish this, air velocities of 3,000 feet per minute are maintained between the drill stem and the side of the hole. Jet type tri-cone bits have been developed to improve the air cleaning action at the bottom of the hole.

In the past two years, the drilling industry has become increasingly aware of the possibilities inherent in having a "down the hole" source of power for driving the rotary drill bit. Tests for this method have been conducted since 1873, but only recently, with reported success with Russia's turbodrilling, has there been such widespread interest. The turbodrill has put down 5,400 to 5,600-foot deep wells in eight days, compared to 36 days for rotary mud drilling. Proper bit design is the major problem now, since turbodrills run from 500 to 600 revolutions per minute.

Large diameter holes have also been successfully drilled by rotary methods. A 75-inch-diameter shaft was drilled to a depth of 452.2 feet in 55 days. In one installation, 12 rolling cutters were installed around the periphery of a core barrel. The cutters were mounted on conventional tri-cone type bit bearings. These removed a four-inch kerf around the periphery of the 75-inch-diameter hole. After about five feet of a core has been drilled, the drilling machine is withdrawn from the hole and the core catcher is inserted. A small explosive charge is used to break off the core, then camming devices on the core catcher engage the large cylinder of rock and it is hoisted out of the hole. Other large hole drilling methods utilize pilot holes which are in turn enlarged by reaming to diameters up to 9.0 feet.

American Zinc Company of Tennessee is drilling a 66-inch-diameter ventilation shaft at its Young mine in Tennessee with a special Calyx type drill. See Sep-

tember 1957 MINING WORLD, pages 60 to 64. An advance of one foot per hour of drilling time at a total cost of \$100.00 per foot has been achieved. However, direct operating costs varied from only \$40.00 to \$50.00 per foot.

BLASTING: The most significant developments in blasting have occurred in the field of fertilizer grade ammonium nitrate. This product produces larger gas volume than any other explosive material commonly used, and is the cheapest explosive available to open-pit operators. The rate of detonation of pure ammonium nitrate varies from 6,600 to 11,900 feet per second. Smaller particle size, lower apparent density, greater confinement and higher efficiency of primer serve to increase speed, as do certain additives. The superiority of prilled ammonium nitrate is laid to fine particle size and porosity, which gives low density and which, because of its free running characteristics, gives good confinement. Diesel fuel is usually added in the 50- or 80-pound bags and allowed to stand for several hours in order to increase penetration of the oil. Six to eight percent, by weight, is usually added. In cases where there is difficulty in breaking bottom, higher density grained ammonium nitrate or ammonium nitrate dynamites are often used at the bottom of the hole. Proper detonation of prill-oil mix determines its effectiveness. High velocity primers with approximately 60 percent strength are required in order to get the maximum rate of detonation. With adequate detonation, velocities of prill-oil mix are reported to be approximately 15,000 feet per second. Several of the operators who have replaced nitrocarbo-nitrate explosives with prilled ammonium nitrate-Diesel oil have reported 40 percent savings in explosive cost. Many experiments are currently in progress to determine the minimum primer required. The primer size is a function of the hole diameter and the weight of the powder load. In some instances, 9-inch-diameter drill holes are being successfully detonated with primers weighing less than 1.0 percent of the powder load. Shots are usually fired with

detonating fuse using millisecond delay connectors. Primers costing as little as \$0.70 apiece have been successfully used. Fertilizer-grade ammonium nitrate costs approximately \$80.00 per ton. The strength of prill-oil mixes, by weight, is comparable to about 50 percent dynamite.

At Kennecott Copper Corporation's Utah Division's Bingham pit, research has been conducted into the loading of horizontal "toe" holes with prill-oil mixtures. Depths of these holes vary from 24 to 28 feet and they are inclined slightly downward so that they bottom five feet below the bench level. Horizontal spacing of these holes averages 22 feet. These "toe holes" are drilled by 4-inch-drifter machines, mounted on self-contained mobile drill units using 3-inch starter bits and bottoming at a minimum of 2½ inches in diameter. These holes are sprung or chambered with Gelamite stick powder, having a 65 percent weight strength. Their research work has led to a completely mobile loading machine, a 4-wheel drive truck, equipped with 125-cubic-foot-per-minute rotary compressor, powder blowing machine, Diesel fuel tank, and hose reel. Two of these trucks are being used to blow prilled ammonium nitrate into the "toe holes." A metering device has been built into the blower unit to inject Diesel fuel into the hole in the proportion of 1.0 gallon per 100 pounds of ammonium nitrate. Kennecott has substituted commercial grade ammonium nitrate powder for conventional dynamites with 65 percent weight strength, on a pound for pound basis, resulting in a powder factor of about 10 tons of material broken per pound of powder used. Shots are being detonated with five pounds of 65 percent weight strength dynamite.

Of particular importance here is the mechanization of powder handling—the development of equipment to handle the powder in bulk and transport and load the powder with a single vehicle.

Further developments in the bulk handling of prilled ammonium nitrate are reported at the Geneva plant of the U.S. Steel Corporation, where trucks are being designed to transport the prills from the manufacturing plant directly to drill holes at the Corporation's iron ore mines in the Cedar City, Utah district.

The method of transportation used for



ROTARY DRILLING was used by American Zinc Company of Tennessee to sink its new 66-inch diameter air shaft at the Young mine. Cost was lower than by regular sinking methods.

Open Pit Mining

the removal of ore and waste from open-pit mines falls naturally into four rather broad categories: rail haulage, truck haulage, conveyor haulage, and skip haulage. The categories are broad because frequently two or more transportation methods are used together. The choice of which method to install in a particular mine is quite naturally an economic one—that is, the method or combination of methods available at the lowest capital investment and the lowest operating cost consistent with good mining practices. In the design of any type of mine transportation system, a primary consideration is the maximum grades upon which the system can operate. With rail haulage, the maximum is 3.0 percent; with trucks, it is about 10; belt conveyors can be operated on grades up to 30; and the inclined skips are limited to only the slopes of the open-pit walls.

CONVEYORS: Pioneering in the application of belt conveyors to open-pit mining has been done in the Lake Superior iron district. In the last 25 years more than 400,000,000 tons of iron ore have been carried on conveyor belts. The mine operators of that district have contributed substantially to the techniques which are used today.

Conveyor belts have been constructed with capacities ranging from a few tons to 6,000 or more tons per hour per belt. Belt widths of 60 to 72 inches are common and speeds of 800 feet per minute are being used for some of these wide belts. With the new developments, greater capacities, and longer lifts, cheaper operational and maintenance costs are a certainty.

Robins Conveyors Ltd. of Johannesburg, Union of South Africa, is constructing a conveyor system, 8,000 feet long and 54 inches wide, at the Nchanga Consolidated Copper Mines, Ltd., in Northern Rhodesia. Gathering is done with 42-inch conveyors. The conveyor system will carry clay and soil that will be stripped from the surface of the open-pit mine to provide access to the copper ore. Material will be removed by two bucket wheel excavators that will cut benches at 86-foot intervals in the large pit. Belts will travel at 800 feet per minute, and will move about 50,000 cubic

yards per day. At the waste disposal site, a standard gauge railway parallels the conveyor belt so that a large track shifter can be used to move the belts when necessary. Engineers in South Africa have stated that this project will be the largest earth moving operation ever undertaken in Africa. It is expected that a mountain of waste containing 100,000,000 cubic yards will be accumulated in seven years of stripping.

In a West German brown coal mine near Cologne, a very large bucket wheel excavator is capable of loading 100,000 cubic meters per day into 100-cubic-meter railroad cars. This tremendous machine weighs 5,600 tons, yet it is readily moved on caterpillar tracks. The 51-foot-diameter digging wheel has 10 buckets of about five-yard capacity each.

In a brown coal mine in Schwandorf, Bavaria, a somewhat smaller bucket wheel excavator is employed in a 100 percent conveyORIZED mining operation. Both stripped material and coal are conveyed on the same belts at a speed of approximately 800 feet per minute. Stacker belts are run at almost 1,600 feet per minute to project the waste material as far as possible beyond the end of the belt. This is probably the first completely conveyORIZED pit operation in existence.

SKIPHOISTING: Several mining companies in the west are giving serious consideration to the use of skips in open pit mining. These units, first developed by National Iron Company, are designed to hoist a truck load of mine run rock up an inclined railway. Several Rockover skip installations have been made for use with 22-ton-capacity trucks. The installations are designed so that level or down hill truck hauls are made to the skip loading station in the pit bottom. In some installations intermediate skip loading stations are also used. At one installation, at Marmora, Ontario, a double-drum hoist driven by a 1,250-horsepower electric motor transfers ore from the pit up a 45° incline, skipway to the primary crusher. Skips normally operate in balance on inclines varying from 38° to 45°. Recently, the Lakeshore Engineering Company of Marquette, Michigan, has offered a bottom dump "jet incline" skip in sizes ranging up through 40 tons. One

proposed installation using 35 ton skips on a 1,200-foot haul at 45° has an estimated capacity of 8,750 tons per shift.

TRANSPORTATION OF SOLIDS IN PIPELINES: A significant pipeline project was initiated this past year. The American Gilsonite Company placed in operation its 6-inch-diameter pipeline which transports 700 tons per day of gilsonite ore. This solid hydrocarbon is pumped as a slurry containing about 35 percent gilsonite solids in water. The pipeline crosses rugged mountain terrain in western Colorado. It spans two canyons via suspension bridges and crosses an 8,500-foot-high mountain pass as it travels from Bonanza, Utah to Gilsonite, Colorado. Design and pilot plant work for this \$2,000,000 pipeline was done by the Colorado School of Mines Research Foundation Inc., Golden, Colorado.

At the El Salvador property of Andes Copper Mining Company, plans are being completed for a 6-inch pipeline which will transport a copper concentrate with a specific gravity of 5.0. This pipeline will carry the concentrate, as a slurry, for approximately 10 miles to a railroad loading station. Many other excellent examples of pipeline transportation of solids could be cited, such as phosphates in Florida and uranium-bearing gold tailing near Johannesburg.

This technology has also seen wide application in underground mining. Principally for introducing mill tailing for stope backfilling. Hydraulic backfilling presents a fast, inexpensive means of providing permanent ground support in an active stope. It is, therefore, a valuable tool with which the mining engineer can design stoping methods for the future. It permits opening up larger areas, since they will be open for only a fraction of the normal time and ground movement can be controlled with positive support. Rock bursts and subsidence can be prevented. Hydraulically placed sand fill provides a horizontal surface on which scrapers, railroads, track mounted equipment, and wheeled vehicles can be effectively operated. It, therefore, makes possible the use of larger, faster, heavier, rock moving equipment in underground operations. An outstanding Symposium on Hydraulic Backfilling will be presented at the Montana School of Mines in Butte on May 9 and 10, 1958.



BUCKET WHEEL EXCAVATORS were of growing interest to United States mining companies during 1957. This unit is in Germany.



SKIP HOISTS are now used at western copper mines. One system has been designed to hoist 8,750 tons per shift from deep pit.



Mining World Presents 1958 Blue Ribbon Equipment Awards

On the next few pages are the new or improved products marketed in 1957 which were judged to offer the most outstanding contributions to the technology of mining and metallurgy. Mining World's annual Blue Ribbon Equipment Awards are selected from hundreds of entries submitted by manufacturers throughout the world.

Judging is done by an impartial panel composed of leading authorities from all specialized branches of the industry. This year's panel convened at Denver in February. The panel, pictured above, includes from left to right:

Stanley H. Dayton, associate editor, Mining World.

Dr. Paul Kerr, Department of Geology, Columbia University, an authority on tungsten and uranium.

George O. Argall, Jr., editor, Mining World.

Richard Young, vice president, American Zinc Lead & Smelting Company; wide experience in zinc and uranium metallurgy.

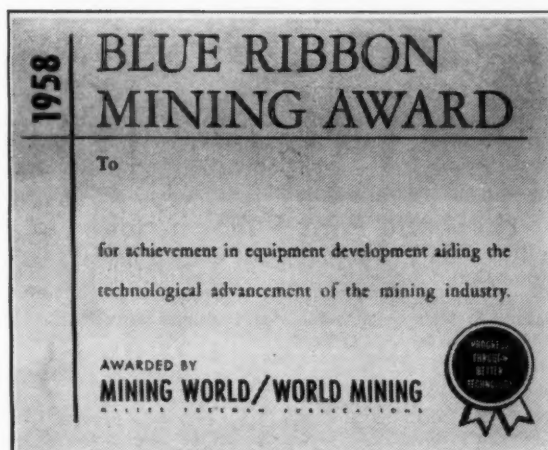
Vernon L. Mattson, manager mining & milling, Kerr-McGee Oil Industries, Inc.; expert in potash and phosphate metallurgy.

Bertram D. Thomas, president, Battelle Memorial Institute; scholar, scientist and administrator with patents in the mineral separation field.

F. A. McGonigle, vice president, Haile Mines, Inc.; world-wide background in flotation and mining.

Robert Henderson, resident manager, Climax Molybdenum Company; extensive underground experience.

John P. Herndon, mine superintendent, The Anaconda Company (Jackpile mine); unable to attend, entries were mailed to him. He has world-wide mining experience.



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Control & Laboratory Equipment

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For further information on award items,
use Reader Inquiry Card following page 224



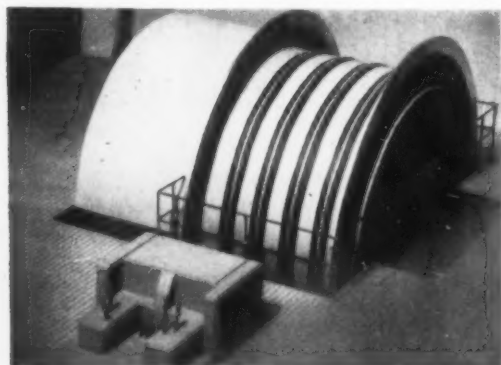
Blue Ribbon Equipment Awards

Underground



Libu Side Tipping Bucket

The Libu Bucket is the first side tipping bucket without end walls for use on Caterpillar Traxcavators. It can tip to the left, right, or forward. As a result minimum movement of the loader is required. Circle No. 1 on inquiry card.



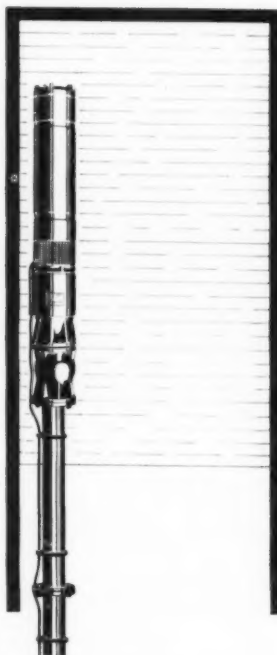
Eisenhutte Prinz Rudolph Hoist

The German EPR-design of the Koepe-pulley and drum feature by means of combination driving pulley and motor, and axial-acting block brakes a 30% saving in floor space, power, and weight reduction. Circle No. 2 on inquiry card.



Wagner "Mole"

Nicknamed the "Mole", this underground mucker has a 1¼-yard bucket. All parts of this unit are lower than the top of the tires. The highly maneuverable "Mole" has a 4-wheel drive and 4-wheel positive hydraulic steering. Circle No. 5 on inquiry card.



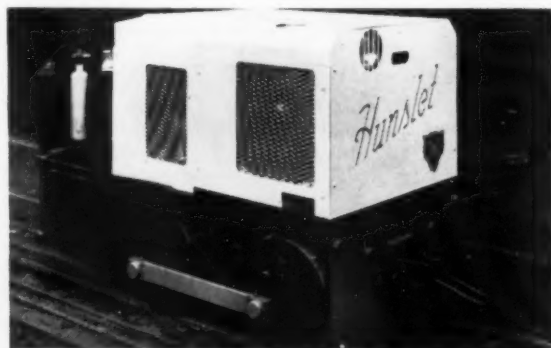
Pleuger Pump

Produced by Pleuger Unterwasserpumpen G.m.b.H. of West Germany, this submersible electric sump pump is designed to handle volumes up to 3,000 gpm, and heads to 1,300 feet. Motor is water filled and water lubricated. Circle No. 3 on inquiry card.



C. S. Card Skip

The Card Automatic Bottom Dump Skip features a skip body and frame in a unitized construction with excellent counterbalancing qualities. Overlapping and fast opening door can eliminate all spillage down shaft. Circle No. 4 on inquiry card.



Hunslet Underground Locomotive

The compact Hunslet Engine Co. "Tiger Tim" underground locomotive develops 23 hp at 1,500 rpm, with a water-cooled Diesel using a scrubber. Featuring a torque converter, the unit has a maximum tractive effort of 2,240 pounds. Circle No. 6 on inquiry card.

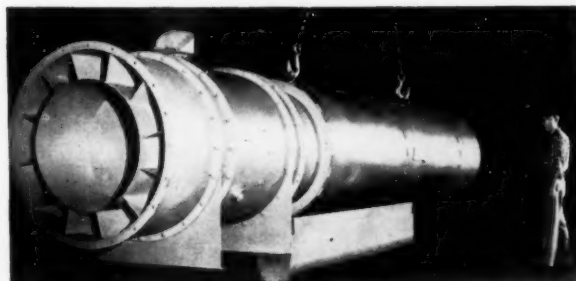
MINING WORLD'S Awards For 1958

Blue Ribbon Equipment Awards



CF&I Left-Hand Rock Bolts Threads

Ordinary stoppers or sinkers on feed legs provide enough torque to tighten the new CF&I expansion type rock bolts. No special tools or equipment are needed except for a short shank with a socket end, to fit the drill. Circle No. 7 on card.



Joy Microdyne Dust Collector

Described as 1/10 to 1/20 the size of comparable equipment, this Joy Microdyne dust collector is a wet, inertial type which is claimed to recover 99 percent of particles five microns in size or greater. Circle No. 8 on inquiry card.

General Equipment & Supplies



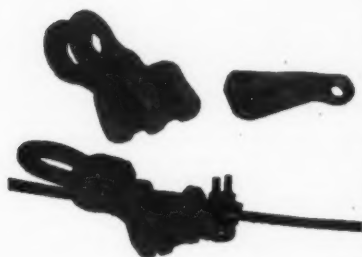
August Thiele Conveyor

The August Thiele Steel Plate Conveyor, of German design and manufacture, is a rugged unit designed to convey ore or other heavy materials, on an incline or around curves having a minimum radius of five meters. Circle No. 9 on inquiry card.



Staplex Air Sampler

The 10-pound Staplex HiVolume Air Sampler is used for accurately sampling large volumes of air for particulate matter by means of a filter paper. It is claimed to sample air containing particles down to 1/100 micron. Circle No. 10 on inquiry card.



Sauerman Clamp

The Sauerman Continuous Cable Clamp is used to quickly attach a Dragscraper or other unit to a load line. This fitting quickly attaches or removes a load from any place on a continuous cable. The clamp sizes are 3/4 to 1 1/4 inches. Circle No. 11 on inquiry card.



Harnischfeger Overhead Crane

An overhead traveling crane with 60 ton main hoist and two 20 ton auxiliary hoists has been developed by Harnischfeger. P&H says this is the first mill crane to offer stepless variable speed control with AC instead of DC power. Circle No. 12 on inquiry card.

MINING WORLD'S Awards For 1958



Blue Ribbon Equipment Awards

Open Pit



Reich Bros. Drill

Here's a light weight, self propelled air blast hole drill for drilling in hard rock. Using the "down-the-hole" principle of drilling, the unit drills 4-3/4 inch holes to approximately 300 foot depth. Circle No. 13 on inquiry card.



Esco Dragline Bucket

Due to the design of the Electric Steel Foundry Company's Triple Tapered Dragline Bucket, faster loading, cleaner dumping, and longer bucket life is possible. All-welded construction is featured on the unit. Circle No. 14 on inquiry card.



Gardner-Denver Air-Trac

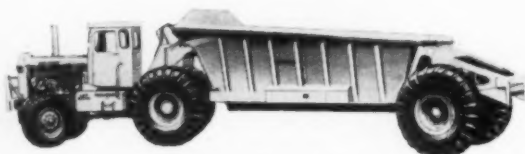
The Gardner-Denver Air-Trac is a self-propelled, self-contained unit, featuring centralized, hydraulic remote controls. Field tests in hard rock have shown the unit to average a drilling speed of 1.3 feet/minute of 2-1/4 inch hole. Circle No. 15 on inquiry card.

Westfall Tractor

The Westfall "Performer" is a positive, four-wheel drive, pneumatic-tired tractor. The unit is powered by a 262 Cummins Diesel and has front wheel, full power steering. All 4 wheels have a locked momentum feature, preventing any wheel from spinning out. Circle No. 16 on inquiry card.



Design features of the new Athey Products Corporation 27-cubic-yard capacity bottom dump trailer,



Athey PW20 Bottom Dump Trailer

enable the unit to ride out over, not through, the dumped load, to make hauling and dumping easier. Called the PW20, the unit is designed to operate behind the Cat DW20 Tractor. Circle No. 17 on inquiry card.

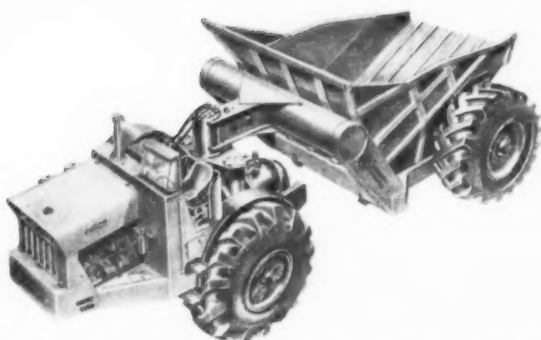


Kenworth 803-B Haulage Unit

The Kenworth 803-B rear-dump semi unit, has a rated payload capacity of 64 tons or 40 cubic yards struck. Powered by a single 12-cylinder Diesel engine, the unit will be offered with either the 400 hp or 600 hp model of this engine. Circle No. 18 on inquiry card.

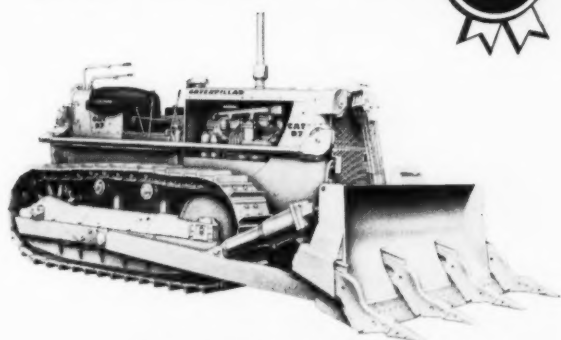
MINING WORLD'S Awards For 1958

Blue Ribbon Equipment Awards



Continental-Wooldridge Rear-Dump Unit

The Continental-Wooldridge CWD-221 Rear-dump unit is capable of hauling a 35 ton payload at speeds up to 30 mph. Smooth operation and ease of control is assured by using a torque-converter drive. Circle No. 19 on inquiry card.



Caterpillar Gyrodozer

This Caterpillar Bulldozer blade with attached 23-inch ripping teeth, allows ground ahead of blade to be cut up, thus speeding up the bulldozing action. Hydraulic cylinders allow full control of tipping and tilting from cab. Circle No. 20 on inquiry card.

Exploration



"Super Scout Diamond Drill"

The 85 pound Super Scout drills to depths of over 60 feet and drills in any direction. A one-man unit, the rig consists of a drill, anchor column, and hand operated hydraulic feed cylinder which will deliver 1,000 psi on bit. Circle No. 21 on inquiry card.

Walker Bros. Hoist

Here's a Diesel-electric portable hoist developed by Walker Bros., Ltd., in England. The unit is used for emergency hoisting and is capable of raising five tons from 3,000 ft. at a speed of 720 ft./min. Circle No. 22 on inquiry card.



Boyles Bros. "Bazooka"

Here is a lightweight diamond core drill manufactured by Boyles Bros. Ltd. The unit is ideal for mines where short hole testing to 100 ft. is required. Mounted on a bipod, it is held to the walls by an eye bolt assembly. Circle No. 23 on inquiry card.



Varian's M-49 Magnetometer

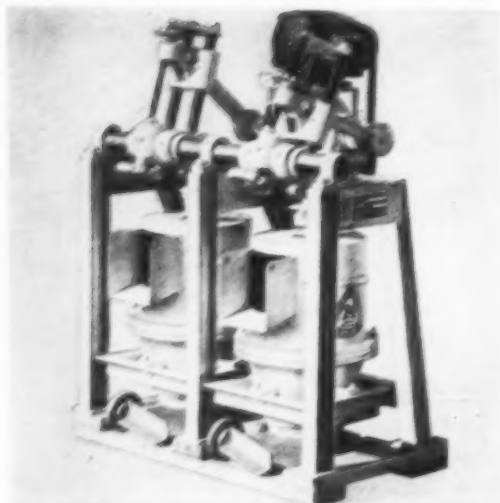
Varian Associates' M-49 portable Magnetometer is rugged and transistorized. Weighs less than 16 pounds and is accurate to 10 gammas. Reading is independent of the orientation of detecting device with respect to earth's magnetic field. Circle No. 24 on inquiry card.

MINING WORLD'S Awards For 1958



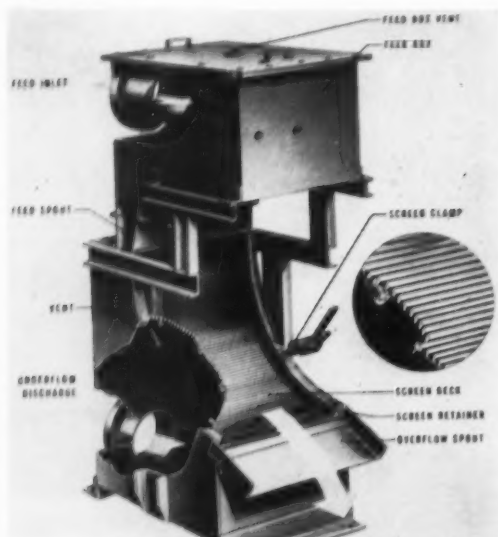
Blue Ribbon Equipment Awards

Ore Treatment



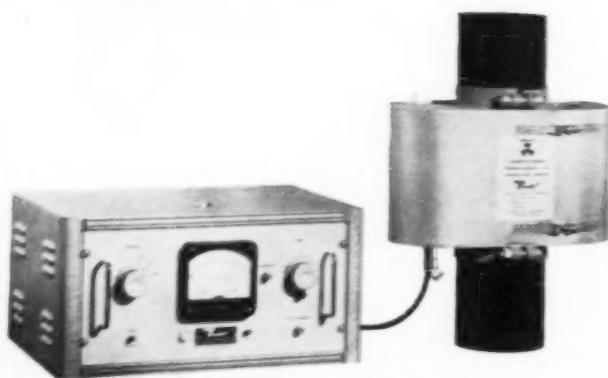
**Denver Adjustable Stroke
Diaphragm Pump**

Developed by Denver Equipment Co., this pump has a longer stroke and up to 75% higher capacity as compared to conventional models. Adjustments can be made while pump is operating. Pumps are available to 1,000 gpm. Circle No. 25 on inquiry card.



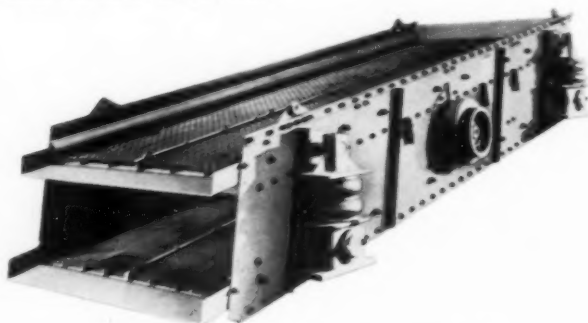
Dorr-Oliver DSM Screen

The Dorr-Oliver DSM Screen is a high capacity stationary screen for separations in the 8 to 100 mesh range. Wedge bars on screen surface separate at size about one half the spacing between bars. Circle No. 27 on inquiry card.



Bendix Nuclear Density Gage

The Bendix Aviation Corporation Nuclear Density Gage measures and controls density, specific gravity, concentration and or percent solids of slurry systems. Slurry is measured in pipeline, without the sensing head coming into contact with solution. Circle No. 26 on inquiry card.

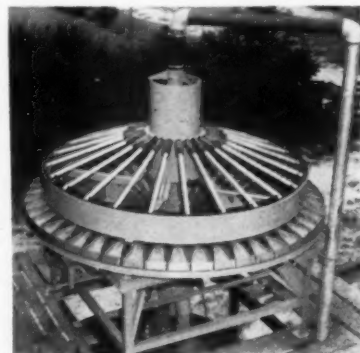


**A-C Air Spring Suspension for
Vibrating Screens**

Developed by Allis-Chalmers Manufacturing Co., the springs provide 98 to 99 percent vibration isolation, depending on the air pressure used. The air springs make it possible to adjust to weight differences by altering the air pressure in the springs. Circle No. 28 on inquiry card.

**Cannon
Circular
Concentrator**

Developed by the Cannon Concentrator Co., this unit has no moving parts and uses specific gravity to effect a separation. The unit is said to work best on slurries of high density. Circle No. 29 on inquiry card.



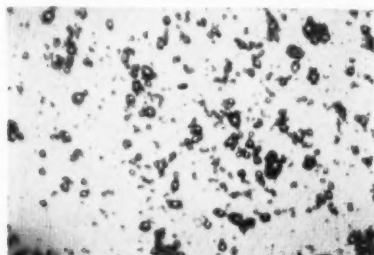
MINING WORLD'S Awards For 1958

Blue Ribbon Equipment Awards



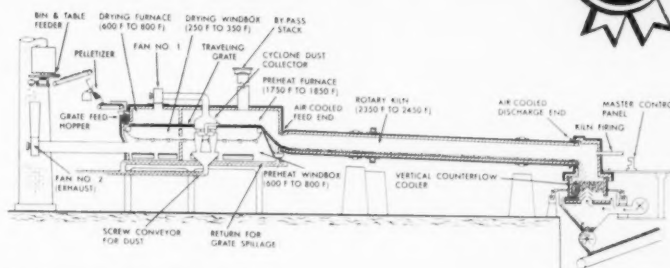
A-C Process and Equipment for Treating Iron Ore Concentrates

Here's a new process and equipment developed by Allis-Chalmers Manufacturing Co., to pelletize and heat treat magnetic concentrates, to produce hard, durable pellets for blast furnace feed. Circle No. 30 on reader inquiry card.



**Knapsack-Griesheim
Ferrosilicon**

"Ferrosilicon 15% Atomized" has been developed by Knapsack-Griesheim. This spherical shaped media has many advantages over conventional angular media. Circle No. 32 on inquiry card.



Telluride Mobile Tailings Disposal Unit

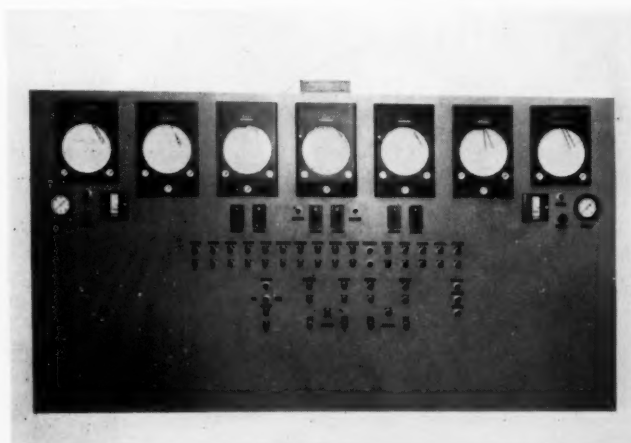
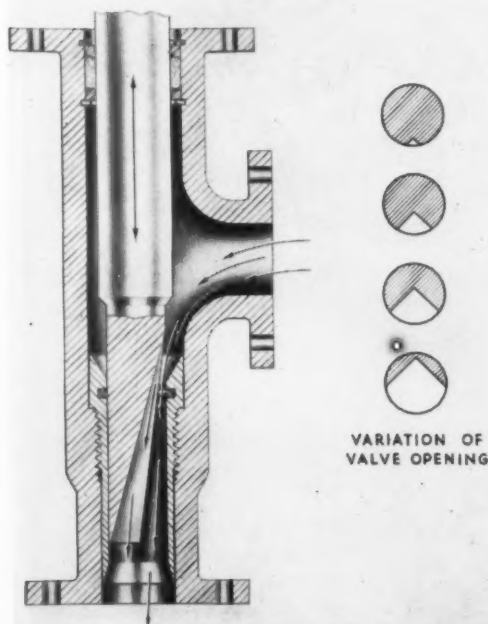
Here is a mobile unit consisting of a series of Telluride Iron Works Cone Classifiers, that are truck mounted. As tailing pond builds up from processed tailing, unit may be easily moved. Circle No. 31 on inquiry card.



Control & Laboratory Equipment

General American Tapered Orifice Valve

The General American Valve Co., has utilized a new concept of flow control, in developing the Tapered Orifice Valve. The valve is designed to give infinitely variable control to the movement of slurries through an orifice without any clogging taking place. Circle No. 33 on inquiry card.



Industrial Physics & Electronics Control System

Here is a control panel for a grinding circuit of a large ore concentration plant. Grinding circuit control is automatic. All circuit adjustments are made on this panel. Industrial Physics & Electronics have developed this integrated system to operate an entire mill. Circle No. 34 on inquiry card.

MINING WORLD'S Awards For 1958



SMIDTH

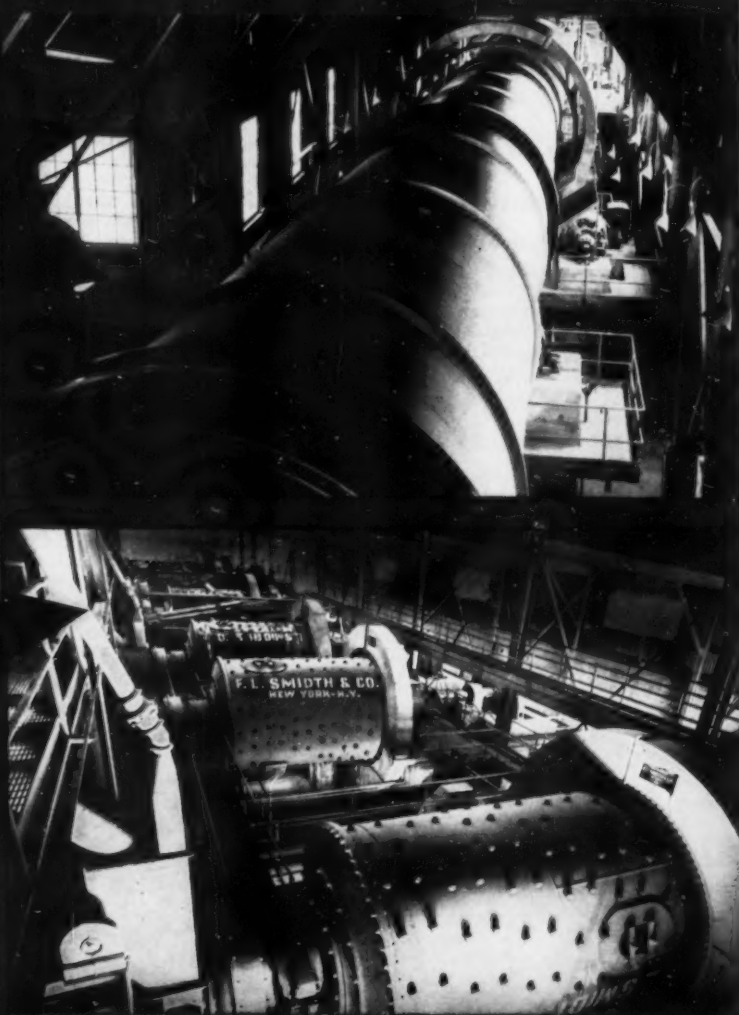
Rotary Kilns

For sintering, nodulizing, calcining, desulphurizing, oxidizing and reducing roasting—coolers, precoolers, preheaters, recuperators—and auxiliary equipment.

Grinding Mills

Ball mills, tube mills and multicompartment mills—open or closed circuit—wet or dry grinding also air swept for grinding and drying.

Over 1,000 Smidth Rotary Kilns and over 5,000 Grinding Mills supplied all over the world.



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11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co., Ltd.
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Co. (Bombay) Private Ltd.
42 Queen's Road
Bombay, India



REVIEW & FORECAST OF Metals and Minerals

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ALUMINUM

"New applications are expected to raise aluminum use in a new home from 30 to 1,000 pounds"

LAWRENCE LITCHFIELD, JR.
Vice President and General
Manager Mining Division,
Aluminum Company of
America, Pittsburgh, Penn-
sylvania

The principal happening in the aluminum industry during the past year was the definite ending of the post-war era of shortages. This ending occurred not because of any sharp decline in the use of aluminum, but because of the great increase in its supply. The supply has become so much greater that it has permitted an increase in consumption over 1950 amounting to at least 60 percent. All indications are that the available supply of metal will be more than adequate to fulfill the anticipated demand throughout the year 1958.

Metal demand and supply is reflected in bauxite and alumina production. Total domestic bauxite production for the first three quarters of 1957 was 16 percent below the same period the previous year; however, imports for consumption during the like period reached 5,032,332 tons, a new nine-month high. Third quarter imports, 1,982,000 tons, reached a new quarter high, largely attributable to acquisitions for the national stockpile and for private stocks for new alumina plants.

Last year saw the first imported bauxite from Haiti, which amounted to 4.8 percent for the first three quarters. Other percentages for the same period were: Jamaica, 48.4 percent; Surinam, 40.5 percent; British Guiana, 5.8 percent; others, 0.5 percent.

Continuing to seek new areas of bauxite, aluminum producers are conducting exploration in Hawaii, Panama, and Costa Rica, and are even going as far afield as Australia and Africa to find mining concessions. In fact, Reynolds Metal Company, and Aluminum, Ltd., have formed subsidiaries to prospect and develop concessions and leases in Australia.

Harvey Aluminum Company was granted a license to prospect for bauxite in Jamaica. If that company begins mining operations there, it will join Aluminum, Ltd., Kaiser Aluminum Company, and Reynolds Metal Company. Harvey has also arranged to purchase Japanese alumina to be shipped to its new smelter on the Columbia River, near Portland, Oregon.

Aluminum Company of America and Kaiser have signed contracts for bauxite exploration and production in Panama.

Alcoa is continuing construction work preparatory to initiating bauxite mining operations in the Dominican Republic.

We are very optimistic about the longer-term outlook because unit consumption of aluminum has increased in many of its big markets, such as automobile, residential construction, and home appliances.

The present surplus of metal is actually a healthy sign. It means that many more designers and fabricators, confident of the availability of aluminum, will now feel free to capitalize on the natural advantages of the lightweight metal.

This new confidence already is being reflected in important market areas.

For instance, look at residential building. Intensive development of new applications and distribution methods is expected to raise aluminum usage in the average new home from about 30 pounds today to 1,000 pounds by 1965. Home remodeling will consume much additional tonnage.

Applications of aluminum in the non-residential building field are progressing steadily; a great new market is in the highway construction field, where the industry has advanced such aluminum applications as maintenance-free lighting standards, bridge railing, signs, and chain-link fencing.

Packaging and containers are another fast-growing market area, and the industry is doing more and more in the way of research and development in this field.

A number of significant technological advancements were announced last year. One was a new aluminum-lithium alloy, marking a major break through the thermal barrier for applications of aluminum in supersonic aircraft. Also announced, was the commercial availability of aluminum powder metallurgy products, aluminum asphalt paints, aluminum sheet in extra wide widths and unprecedented flatness, an improved extruded aluminum flooring system for highway trucks and trailers, and high-strength nonheat-treatable alloys with excellent welding characteristics.

Avenues for further applications of aluminum were opened with the introduction of new high-temperature soldering materials and foamed-plastic insulated panels for the building, refrigeration, and other industries.

Despite the rapid progress already achieved in the aluminum industry, we are confident that our favorite metal is headed for an increasingly important position in the nation's future economy.



ANTIMONY

"Indicates large potential uses for these compounds in many new types of electronic devices"

JAMES P. BRADLEY
Vice president, Bradley
Mining Co., San Francisco,
California

Except for the small byproduct output of antimony from the silver-lead ores of the Sunshine Mining Company in Idaho, the domestic antimony mining industry is practically non-existent. There are many known antimony deposits in the western United States, but domestic miners are unable to compete with low-cost antimony imports due to inadequate tariff protection.

Bolivia, Europe, Mexico, and South Africa supply the bulk of United States requirements for primary antimony and

about two-thirds of our antimony imports are from overseas sources.

Governmental and industrial sponsored research on the antimony semiconductor compounds (aluminum-antimony and indium-antimony) is continuing and indicates large potential uses for these compounds in many new types of electronic devices.

United States Primary Antimony Production, Consumption, and Imports in Short Tons of Contained Antimony in 1955, 1956, and 1957

Item	1955	1956	1957*
Domestic mine production	630	590	650
General imports	12,000	12,500	16,200
Consumption	12,000	12,900	10,400

* Estimated.

ASBESTOS



KARL V. LINDELL
Vice President, Canadian
Johns-Manville Company,
Ltd., General Manager,
Johns-Manville's Asbestos
Fibre Division, Asbestos,
Quebec

**"There have been developed more than
3,000 uses for this versatile fiber"**

There is a considerable time lag in obtaining world statistics on asbestos fiber, but preliminary figures indicate that total production in 1957 may have reached almost 1,800,000 tons, an all-time record.

Canada, the largest producer, maintained its ratio of slightly more than 60 percent of the world market or almost 1,100,000 tons with an estimated value in excess of \$100,000,000. When the final figures are reported, Canadian production may have set a record in 1957 in tonnage of fiber shipped and in dollar sales volume. In 1956 Canadian fiber shipments amounted to 1,014,249 tons valued at \$99,859,969. Canada's previous record year was 1955 when 1,063,802 tons were shipped with a value of \$96,191,317.

About 97 percent of Canadian fiber is exported. Canada itself is able to absorb only a small part of total production and exports are of vital importance to the industry and to the Canadian economy. Economically, expansion of Canadian facilities for manufacturing asbestos products is not feasible because of the greater cost involved in shipping the other materials used in conjunction with asbestos fibers. As the Canadian market is able to absorb Canadian-made asbestos products, facilities are being made available.

The United States is Canada's largest customer using about 60 percent of Canada's exports. Western Europe—France, West Germany and Italy—was Canada's second best market in 1957, followed by Japan, South America, and Australia.

Southern Rhodesia was second to Canada in production with an estimated 299,000 tons followed by the United States, 50,000 tons; Western Europe, 48,000 tons; Australia, 14,000 tons and Russia, 260,000 tons. The latter figure is a Canadian government estimate. It is possible that Russian production may

be substantially higher. Russia's output, of course, can only be very roughly estimated. However, it is known that Russia has a fairly extensive domestic market and has been exporting substantial quantities of asbestos fiber to Western Europe, thereby offering greater competition to Canadian and Southern Rhodesian fiber.

Nevertheless, the dominant note among Canadian asbestos producers is one of optimism for the future. This is best exemplified by the industry's expansion in recent years. This expansion will be virtually completed in 1958 and will represent an expenditure of about \$100,000,000.

Most of this expansion has taken and is taking place in Canada's eastern Townships—the Asbestos-Thetford Mines area—which produces about 65 percent of the Free World's asbestos. British Columbia and northern Ontario are Canada's other asbestos producing regions.

Expansion programs and new developments throughout the Canadian industry are expected to increase Canada's production capacity by about 200,000 tons. It is estimated that employment in Canadian industry will increase from about 7,000 to 7,500 before the end of 1958.

Exploration for new sources continued during 1957. There are promising prospects in Newfoundland, northern British Columbia, and the Yukon territory.

As a result of constant and intensive research by the asbestos industry over the years, there have been developed more than 3,000 uses for this versatile fiber for the home, industry, and defense needs. For example, there was an increase in demand for the lower and cheaper grades, known as "shorts." These fibers are widely used in products requiring a fibrous filler such as floor tile, plastics, and certain types of paints.

At present it appears that demand for Canadian fiber will probably be the same in 1958 or may slightly exceed that of 1957. But the industry's expansion program will put it in a sound position to meet the anticipated increased demand in the years following 1958. This demand is expected to reach 1,450,000 tons a year in 1960, and 1,600,000 tons by 1965.

The long range future for the asbestos industry is most promising.

BERYLLIUM

**"When some of potential uses materialize it will
be important to open new sources of beryllium ore"**



D. H. HERSHBERGER
Treasurer, Brush Beryllium
Company, Cleveland, Ohio

The year 1957 was one of transition for the beryllium industry. Through last year, the greater part of the annual consumption of beryl was used to make beryllium copper alloys. Construction of two new plants was completed for the purpose of making pure beryllium metal. Their production is expected to consume 4,000 tons of beryl per year beginning in 1958, compared with the maximum total of 3,800 tons which previously have been consumed for beryllium alloys and compounds, and as ground ore in ceramic applications. It is expected that this new rate of consumption will tend to increase because of the increasing attention now given to the unique physical properties of beryllium.

There has been a substantial increase in research and development expenditure due to the widening interest on the part of designers. The United States Air Force awarded a production development contract for rolling beryllium into sheet. Other research and development projects are directed toward other fabricating techniques. Any measure of success in these efforts should result in additional uses of the pure metal.

During last year, the first commercial orders for beryllium parts in atomic testing reactors were received in competition

**United States Receipts of Beryl in Short Tons by Countries
of Origin for 1952, 1953, 1954, 1955, 1956, and 1957¹**

Country of Origin	1952	1953	1954	1955	1956	1957 ¹
Afghanistan	0	0	11	0	0	0
Argentina	550	1,495	0	441	2,330	1,544
Belgian Congo	0	0	11	128	992	222
Brazil	2,590	2,614	1,828	1,735	2,607	2,165
British East Africa	18	22	23	84	264	56
British Somaliland	0	0	0	9	29	0
British West Africa	0	0	0	0	22	0
Morocco	118	23	0	0	26	0
India	0	0	0	0	1	0
Republic of Korea	196	199	392	845	3,360	1,256
Madagascar	3	8	4	6	0	0
Mozambique	0	330	77	28	212	43
Nigeria	308	392	1,295	620	1,110	965
Pakistan	0	0	0	3	0	0
Portugal	0	0	0	0	15	69
Rhodesia & Nyasaland	105	332	338	283	242	33
Surinam	931	1,296	957	861	559	266
Sweden	0	0	10	0	0	0
Union of South Africa	0	0	5	0	0	0
United States of America	1,153	1,323	865	994	602	670
	515	751	669	500	460	575
TOTALS	6,490	8,749	6,485	6,537	12,831	7,864

¹ Preliminary

with testing reactor designs based upon the use of graphite, light, and heavy water. Beryllium parts of inertial guidance systems were successfully tested, resulting in the first commercial production orders for beryllium gyroscope parts. The experimental use of beryllium in various missile applications further advanced the possible use of beryllium in operational missiles and high speed aircraft. Renewed interest in beryllium oxide was evidenced by inquiries for fabricated beryllia refractory parts. References have been made to the high value of beryllium as a solid fuel for rockets and missiles. The possible use of beryllium for this purpose is being studied.

It is quite apparent that while the national consumption of beryl remains below 10,000 tons per year, the supplies of hand-cobbed beryl will readily suffice. The possibility that additional quantities of beryl will be required has increased interest in the milling of beryl concentrates in the United States. Several reports of such mill construction have been received but, to this time, no samples of a beryl concentrate have been forthcoming. Meanwhile, some of the world production of beryl is

being purchased in Europe, evidently for stockpiling purposes. According to preliminary figures the industry in the United States imported about 7,000 tons in 1957. This, together with the estimated domestic production of 575 tons, exceeds the consumption in 1957 which is estimated at 5,000 tons (4,431 tons for 1956).

It seems likely that the new supply of beryl to the United States in 1958 will be about the same as it was last year, or about 7,500 tons, and that the consumption will also be about 7,500 tons. This balance between supply and demand is based upon present orders and contracts. When some of potential uses materialize, it will be important to open new sources of beryllium ore. Such new sources can be the extensive low-grade deposits known to exist in this country, and the many pegmatites here and in Canada that are not worked because of the high costs resulting from hand sorting and cobbing. Investigations are under way to develop milling and the beneficiation of beryl so that adequate supplies of beryl concentrates will be available at reasonable prices.



STANLEY H. DAYTON
Associate Editor
Mining World

"Most news centered around the application of boron in the high energy fuel field"

Expansion-minded borax producers took a breather in 1957. Production leveled off at about 2 percent below the output of 1956. Consumption was down, too, but only slightly. Most news centered around the application of boron in high energy fuels; in fact, this topic has become a favorite for discussion in the financial canyons of New York, Chicago, and San Francisco. But the impact of fuel research and development on the future of boron can't yet be predicted accurately.

Three producers, all located in Southern California, accounted for about 95 percent of the world supply of borax. United States Borax & Chemical Corporation completed conversion of mining facilities from underground to open pit. In November the company dedicated a new \$18,000,000 refinery adjacent to the open pit. The open pit replaces underground production of ore using continuous miners, shuttlecars, and belt-conveyor haulage to the shaft. The open pit ore is drilled with Diesel-powered, 4½-inch augers; blasted with Diesel-soaked ammonium nitrate; loaded with electrically powered shovels; and trucked in 22- to 24-ton loads to the plant located 0.8 miles from the bottom of the open pit. (See June 1957 and March 1958 MINING WORLD.)

Certain components of U. S. Borax's new refinery were over-designed so that additional capacity could be obtained with a minimum of time and expense.

Production continued on a normal scale during 1957 at American Potash & Chemical Corporation and Stauffer Chemical Company operations at Searles Lake in California. Borax is recovered from the brines treated by plants of these two companies. The estimated B₂O₃ content of 1957 production from the three Southern California producers was 308,000 tons. Crude production was estimated at 980,000 tons for the year. A fourth firm, California Borate Company, has developed reserves adjacent to U. S. Borax, but plans for production are unknown.

Major exploration programs in the Kramer district were carried on last year. Perhaps most significant, was the announcement that 40,000,000 tons of low-grade colemanite (calcium borate) had been outlined in an area about 10 miles east of Boron, California. The deposit is located on land controlled by Kern County Land Company. The reserves were indicated on the basis of 17 drill holes. Depth to the newly disclosed colemanite body is estimated to be about 1,000 feet.

Kerr-McGee Oil Industries Inc. also is undertaking a full-scale exploration program in the Mojave Desert near Boron. Kerr-McGee has leased more than 14,000 acres of land from Southern Pacific Land Company for a 25-year period and has the rights to all saline minerals discovered, including potassium, sodium, boron, and lithium.

Though consumption of borax was off a bit in 1957, this trend is not expected to continue. Demand for the raw ma-

terial furnished by producers has more than doubled in the past decade. Together, the glass and ceramics industries accounted for nearly half of the consumption of borax last year. Boron and boron compounds are being used in increasing amounts in fertilizers. Borax has long been used in cleansing agents. Glass, glass fibers, porcelain enamels, fertilizers, and cleansing agents, lumped together, accounted for about 75 percent of the 1957 use of borax.

The potential use of boron in fuels revolves around its high heat of combustion (about 25,000 Btu per pound). By way of comparison carbon releases about 13,000 Btu per pound. Boron also has the ability to lock hydrogen in solid or liquid form, and, next to lithium, is the lightest known substance which can be attached to hydrogen. Diborane B₂H₆ releases 16,000 calories per gram during combustion.

During 1957 Olin Mathieson Chemical Corporation dedicated a new plant near Buffalo, New York, for production of high energy fuels containing boron. Olin Mathieson spokesmen say that within 10 years high energy fuels may become a \$1,000,000,000 industry. Callery Chemical Company has a contract with the United States Navy to produce exotic fuel, containing boron, from a plant at Muskogee, Oklahoma. Metal Hydrides Inc. was awarded a \$9,200,000 government contract in 1957 to produce sodium borohydride (used in making high energy fuels). Delivery of the chemical under the contract started in the final quarter of the year. The contract with Metal Hydrides was the second with the government for this firm in the high-energy fuel field.

In nuclear energy boron is interesting because of its ability to absorb neutrons. Boron-oxygen-carbon compounds have also received a great deal of attention recently. In these compounds, boron is linked directly with oxygen. A wide range of products have appeared in the past 2 or 3 years. They have been investigated as possible ingredients in insecticides, fungicides, pharmaceuticals, hydraulic fluids, stabilizers in plastics, and in paints and enamels.

United States Production, Exports, and Apparent Consumption of Boron Compounds in Short Tons from 1949 through 1957

Year	Sold or Used by Producers ¹		Exports ²	Apparent Consumption ³
	Gross Weight	B ₂ O ₃ Content		
1949	467,592	139,200	109,491	358,101
1950	647,735	191,000	142,580	505,167
1951	862,797	241,000	213,445	649,353
1952	583,828	169,199	103,292	480,536
1953	715,228	213,300	139,317	575,911
1954	790,449	230,500	205,614	584,835
1955	924,496	293,165	222,828	701,668
1956	998,000	315,047	245,000 ⁴	753,000 ⁴
1957	980,000 ⁴	308,000 ⁴	240,000 ⁴	740,000 ⁴

1. U.S. Bureau of Mines. 2. U.S. Bureau of Census Report No. FT-410.

3. Quantity sold or used by Producers less exports.

4. Estimated.

CHROMITE



F. W. LIBBEY
Consulting Mining Engineer,
Portland, Oregon

"There were recurring reports that Russian chrome was to be shipped into the United States"

The long-awaited Long-Range Minerals Program of the Department of the Interior finally reached Congress in 1957 as S. 2375. Hearings on the bill were held during the summer by a subcommittee of the Senate Committee on Interior and Insular Affairs. Part of Secretary Seaton's statement to the committee referring to proposals for payment of production bonuses reads as follows:

"The basically short world supply, coupled with the strategic nature of three of these minerals—namely, beryl, columbium-tantalum, and chromite—as well as the heavy dependence of the United States on distant overseas sources of supply underscore the desirability of making every effort to develop and maintain some production of these commodities from domestic sources."

The chrome miners agreed entirely with this statement as it is the essence of what they have been saying for years. However, when they found out that the so-called bonus for chrome was \$21.00 a long ton for 46 percent Cr_2O_3 ore, their hopes dropped with a thud. This pseudo bonus would hardly pay the freight to eastern markets where the domestic producer would have to compete with foreign chrome mined with cheap labor and, in part at least, subsidized by the United States government. If it really was the intent to make "every effort (sic) to develop and maintain some production . . . from domestic sources," certainly somebody "goofed". Of course "some production" is sufficiently vague to mean almost anything.

The U. S. Bureau of Mines reports that for the first 10 months of 1957 imports amounted to 1,955,027 short tons and consumption was 1,496,683 short tons. These figures indicate that prorated for the 12 month period imports were approximately 2,346,000 short tons compared to 2,175,056 in 1956, and consumption 1,796,000 short tons compared to 1,846,600 in 1956, although consumption was probably off in the last two months of the year because of drop in steel consumption.

Although shipments of Alaska chrome decreased in 1957 because of road washouts, production increased. The Kenai Chrome Company stockpiled 5,000 short tons for beneficiating at the company's 50-ton per day mill which stepped up activity to three shifts a day early in 1958. Sourdough Mining Company, Seldovia, shipped a small quantity of chrome to the government stockpile.

As reported by the California State Division of Mines, chromite production in California increased more than 19 percent compared to 1956. Two new concentrating mills were started, one at South Elder Creek in Tehama County and the other at Scotts Bar in Siskiyou County. Concentrates accounted for more than 75 percent of total production of the state.

The American Chrome Company, Moutat, Montana, appears to have more than passed the halfway mark in its special contract with GSA to produce 900,000 short tons by December 31, 1961. Reportedly, research has shown that a saleable ferrochrome running 50 to 55 percent chromium, 8.5 percent carbon, and 6 percent silicon, can be made from Moutat concentrates of about 38.5 percent Cr_2O_3 and 1.6 to 1 chrome-iron ratio. The company recently announced a pilot plant for ferrochrome will be built at the mine.

In Oregon, W. S. Robertson stopped diamond drilling at the Oregon Chrome mine, the state's largest chrome producer, and the crew was reduced to six men. Ore in sight will be cleaned up and the mine shut down. In the John Day district of Grant County a few mines shipped to the Grants Pass, Oregon purchase depot as in 1956.

The Oregon Department of Geology and Mineral Industries continued its studies of structure of chrome ore bodies and a bulletin on the subject will be published in 1958.

No chromite production in Washington was reported for 1957. In the Twin Sisters chromite area, the Northwest Olivine Company is crushing olivine and shipping the product for refractory purposes.

The U. S. Bureau of Mines reported that at the end of September 1957 receipts of ore and concentrates at the Grants Pass depot totaled 158,667 long tons, leaving 41,333 long tons to be purchased under the GSA program. During January 1958 there was a speedup of receipts of concentrates from southern California. On February 12, 1958, the GSA office in San Francisco, California issued a release notifying chrome shippers that, as of February 7, the balance to be purchased at Grants Pass was 10,562 long dry tons, and the balance under the Carload Program was 6,130 long dry tons, making a total of 16,692 long dry tons to be purchased on that date. It surprised many Oregon people interested in chrome production to learn that a definite quota for the Carload Program had been previously set up. As of February 14, GSA reported that the balance to be purchased at Grants Pass was 9,919 L.D.T. and the balance under the Carload Program 5,711 L.D.T., or a total of 15,630 L.D.T.

Production of Chromite by States in 1956-1957

State	1956		1957 (Preliminary Estimate)	
	Short Tons	Value	Short Tons	Value
Alaska (1)	7,193	\$ 711,481	4,200	\$ 427,000
California (2)	27,082	2,191,956	32,000	2,592,000
Montana (1)(3)	118,780	3,806,926	119,371	3,819,872
Oregon (1) (4)	54,577	2,001,083	7,800	670,800
Washington (1)	30	3,330	—	—
TOTAL	207,662	\$8,714,776	163,371	\$7,509,672

(1) Statistics by the U.S. Bureau of Mines. (2) Statistics by the California Division of Mines. (3) Concentrates sold to GSA under special contract. (4) Includes approximately 45,700 short tons of ore and concentrates mined and stockpiled during World War II. Shipments to the Grants Pass depot during 1956 totaled approximately 8,850 short tons.

COBALT



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Metallurgist, Centre d'Informa-
tion du Cobalt, Brussels,
Belgium

"The reserves of cobalt are sufficient to warrant production at present rate for 80 years"

the high temperature alloy field. Expansion of cobalt alloys is expected in uses where thermal shock, hot wear, hot hardness, and non-galling properties are required.

A 65 percent cobalt alloy for steam turbine blades has been developed by the Westinghouse Research Laboratories. Utica Drop Forge and Tool Company presented a new cobalt-base alloy produced by vacuum melting. General Elec-

The technical future of cobalt seems to lie more than ever in

alloy produced by vacuum melting. General Electric's Jetalloy 1570 is used for power generation in gas turbines at 1,570° F. Another cobalt-base alloy can be improved by a boron addition in order to be used up to 1,800° F.

New cobalt-base alloys are being developed in France and England, while the different grades of Stellites show their outstanding qualities in a great number of countries and applications. Weld-depositing of stellite for hardfacing applications gains more importance as the processing techniques are developed.

In the magnet field the use of Alnico alloys is steadily extending. In the next years a stiff competition to Alnico 5 may be presented by a new fine particle iron material, but it will probably be superseded by a fine particle 40 percent cobalt alloy that is at present being investigated.

A big stimulus for an increased use of cobalt is the actual trend towards higher quality metal. Both electrolytical and thermal refining methods have been improved by the cobalt producers in order to reduce impurity contents (such as carbon and sulphur.) On the other hand, the mechanical properties of a number of cobalt alloys have been greatly improved by using vacuum melting techniques.

The price of cobalt, which had fallen to \$2.35 in 1956, was again reduced to \$2.00 per pound on February 1, 1957.

This price drop, which is due to technological progress resulting in a decrease of manufacturing costs, has been greatly favored by the soundness of the market, where an abundant supply of cobalt is now available for civilian uses.

It is expected that much money will be spent for research on cobalt in the next years. The bulk of the work, including some important fundamental research, is being carried out by the Cobalt Information Center. This organization, which was created in Brussels, Belgium, in early 1957, has its main offices in Brussels and its United States offices within the Battelle Memorial Institute at Columbus, Ohio. In addition, United States government agencies sponsored more than 150 studies on cobalt alloys, mainly for aircraft applications.

Most of the world's cobalt supply is a coproduct from the processing of copper-cobalt and nickel-cobalt ores. As the

Free World Cobalt Production, By Countries, in Short Tons of Contained Cobalt in 1950, 1955, 1956, and 1957

Country	1950	1955	1956	1957
Belgian Congo	5,675	9,443	10,019	9,029
Canada	292	1,630	1,769	1,850*
United States	329	946	1,400	1,625*
Northern Rhodesia	739	871	1,271	1,566
Germany ^(a)	331	1,093	1,031	1,082
Morocco ^(b)	463	834	716	720*
Others ^(c)	71	63	94	128*
Total	7,900	14,900	16,300	16,000*

* Estimated. ^(a) From pyrites mined in Finland and from scrap. ^(b) Cobalt content of concentrate. Metal output somewhat smaller. ^(c) Includes Australia, Mexico, Japan and others.

cobalt ratio of these ores varies within wide limits, the cobalt production can rather easily be adapted to the fluctuations of consumption through a careful choice of the ores to be processed. The producers are thus in a flexible position to respond rapidly to a rising trend in world consumption of cobalt.

On the other hand, production capacity will be increased by some 7,000 short tons within a few years, by new plants or plant extensions of Sherritt Gordon Mines Ltd., Canada (production started in 1956); Chibuluma Mines Ltd., Northern Rhodesia (1957); Metallurgical Resources Ltd., New York (1958); Freeport Sulphur Company, Cuba-Louisiana (1959); Union Minière du Haut-Katanga, Belgian Congo (1960); and Frobisher Ltd., Uganda.

Production statistics in accompanying table take into account not only the direct mine output, but also production from scrap and residues of pyrite roasting. The 1957 production figure is estimated; the final figure will probably come very near to the all-time production record established in 1956.

While consumption is showing a small decrease in the United States, 1955 (4,870 short tons), 1956 (4,781), and 1957 (4,630), the world total consumption of cobalt is steadily increasing.



ANTOINE MOYAR
Economic Counsel, Forminière, Brussels, Belgium

DIAMOND

"The capacity of diamond mining companies cannot meet the sustained demand for gem stones"

The year 1957 was a most satisfactory year for the diamond mining industry.¹

World production of diamonds during 1957 was the highest on record. Official production figures become available only much later in the year for most countries, but total production can now be estimated to be of the order of 26,000,000 metric carats, an increase of roughly 2,200,000 carats, or eight percent over the previous year.

This increase is due mainly to higher output in Belgian Congo, Ghana, and Angola.

No major discoveries of new deposits were reported this side of the Iron Curtain; toward the end of the year the Russian Minister of Geology announced the discovery of diamond deposits in the drainage basin of the Upper Aldan. This would indicate the area Southwest of Tommot, many hundreds of miles to the South of the Vilyui diamond fields.

BELGIAN CONGO: By weight, Belgian Congo is the leading diamond producing country, accounting for 61 percent of the world total.

Its diamond production was about 15,650,000 carats in 1957, which means a progress of 1,640,000 carats or 11 percent over the 1956 production. The Societe Minière du Beceka, which owns the Bakwanga mine and is the most important producer

of industrial diamonds in the world, increased its production from 13,500,000 carats in 1956 to more than 15,000,000 carats in 1957; 97 percent of these were industrial diamonds, mostly crushing boart. This production was entirely absorbed by deliveries to the market. Construction of a central treatment plant is in progress at Bakwanga, and the first half of this plant (two sections out of four) is expected to be operating by the beginning of 1959. This will increase the capacity of production through higher efficiency.

On the Kasai alluvial fields, output was maintained at about 600,000 carats, comprising 30 percent of gemstones in average. Both the Bakwanga mines and the Kasai diamond fields are operated by the Forminière Company as a single unit, under an agreement concluded with the four other concession-holding companies.

SOUTH WEST AFRICA: Owing to the high average size (one stone per carat) and the fine quality of the diamonds recovered, this Territory is the leading diamond producer, by value. The main producing company, Consolidated Diamond Fields of S.W.A., operating in Diamond Area No. 1 at Oranjemund, has produced about 850,000 carats during the first 10 months of 1957. More to the north, Industrial Diamonds S.A. Ltd. (INDOSA) operating in Diamond Area No. 2 at Saddle Hill, produced about 46,000 carats of industrials during the same period.

UNION of SOUTH AFRICA: Owing to the exhaustion of the Kleinzee diamond fields in Namaqualand, and the gradual deepening of mining operations in the pipe mines of De Beers Consolidated Mines at Kimberley and the Premier mine, Transvaal, over-all production for 1957 might be several percent lower than the previous year. The pipe mines account for about 85 percent of production, the balance being produced by the fields operated by the State at Alexander Bay, and by individual diamond diggers in the alluvial fields of Transvaal and the Cape Province.

1. This is an abstract of the complete report in English on the diamond industry which is being published as *The Diamond Industry in 1956-1957* by VLAAMS ECONOMISCH VERBOND, Schoenmarkt 31 VII, Antwerp, Belgium, Price \$2.00. Mr. Moyar is author of this leading survey which includes description of Mining, Trade, Industrials, and Polishing. Copies may be obtained shortly by writing directly to Antwerp.

GHANA (Gold Coast): The alluvial diggings worked by Africans in the Tarkwa and Oda districts produced nearly 1,700,000 carats during 1957. To this must be added the production of the companies, most important of which is CAST (Consolidated African Selection Trust) which produced about 1,150,000 carats in 1957, a progress of about 200,000 carats over 1956. Akim Concessions produced 24,000 carats. Assuming the production of the other companies to have remained at the same level as in 1956, the total for the year would be about 3,000,000 carats, a progress of roughly 500,000 carats, or 20 percent over 1956.

SIERRA LEONE: The official production figure is unpredictable and has little significance anyway, owing to the magnitude of the diamond smuggling operations towards the Liberian border. During the year 1957, Sierra Leone Selection Trust produced about 500,000 carats. This company's remaining mining leases and developed reserves were broken into by about 12,000 illicit African miners. Moreover, in August 1957 its treatment plant at Yengema was invaded by a riotous mob which looted the safes and plundered the supplies. The Government sent reinforcements of police and military to restore law and order. In addition to the production of the concession-holding company, growing quantities of diamonds from the African licensed diggings are being sold to the Diamond Corporation Sierra Leone, officially authorized buyer.

LIBERIA: Official diamond exports from Liberia are estimated to have been between 850,000 and 900,000 carats in 1957, somewhat lower than the previous year's 1,000,000 carats export. Belgium has officially imported from Liberia 740,000 carats of cuttable diamonds in 1957, against 806,614 in 1956. To this should be added official exports to the U.S.A., Lebanon, etc. According to expert opinion, the diamonds arriving in Antwerp from Monrovia are predominantly stones of the Sierra Leone type; others are classed as French Guinea type, and others are considered to come from Liberian diggings. These local diamond fields are reported to extend along a section of the Loffa River, north of the Bomi Hills iron ore deposits, in the western province bordering Sierra Leone. In April 1957 this area had been closed to diamond prospecting and dealing by the government, following a "diamond rush" of men deserting the rubber plantations to dig for diamonds. Diamond dealing is now permissible in the City of Monrovia only.

Measures to control diamond production and export have recently been announced by President Tubman.

FRENCH EQUATORIAL AFRICA: Production for the first three quarters has fallen to 87,245 carats; the yearly figure might be below 1956 by more than 20,000 carats. The grade is declining in most of the deposits now being worked.

FRENCH WEST AFRICA: (Guinea and Ivory Coast) produced 171,500 carats during the first three quarters, but exported 197,760 carats during the same period. The year's total is difficult to estimate, owing to local disorderly developments. The concessions of the companies operating in Guinea, especially the Soguinex, were invaded by about 20,000 "outlaw" miners, most of whom had been expelled from Sierra Leone at the end of 1956. Under the pressure of events and of the local government, Soguinex surrendered part of its concessions and developed reserves to the native diggers; however, encroachments in its remaining leases continue, and tend to increase, as the deposits skimmed by Africans using primitive and wasteful methods are rapidly becoming exhausted.

ANGOLA: The Companhia de Diamantes de Angola (DIAMANG) holds exclusive diamond mining and prospecting rights. Production during 1957 amounted to 860,000 carats, an increase of 120,000 carats or 16 percent compared with 1956. About 60 percent of this production is gem quality. A state-controlled company was formed in Lisbon for the cutting of Angola diamonds. DIAMANG and the Diamond Corporation, London, have subscribed part of the capital of the new company, besides the Portuguese Government and four banks.

TANGANYIKA: Diamond exports for the first 11 months amounted to 348,000 carats. The 1957 production is estimated at about 375,000 carats, most of which have been produced in the Mwadui mine of Williamson Diamonds Ltd., except about 20,000 carats from the neighboring mine of Alamasi Ltd., a subsidiary of Tanganyika Diamond & Gold Development.

The rich Mwadui pipe mine was the property of the late Dr. John Thorburn Williamson, a Canadian geologist, whose death was announced in January 1958 from the mine, where he lived unobtrusively. His discovery of the deposit in 1940, through geological inference and tenacity when he was at the end of his resources, is an epic of the mining industry. The company has a delivery contract valid until the end of 1960 with the Diamond Corporation.

BRAZIL: Nobody knows the exact amount of the Brazilian diamond production, as there is practically no control on the thousands of "garimpeiro" miners, and the major part of the diamonds is exported illegally. There had been no official exports of cuttable diamonds since 1949, but owing to an im-

provement in the international value of the Cruzeiro, token exports were reported at the end of 1956.

VENEZUELA: Exports for the first half-year 1957 were 15 kilograms (gross weight) worth 3,954,036 Bolivars. Production for the year is expected to be comparable, probably somewhat lower, than the 1956 total of 93,834 carats. All mining was done by individual "mineros de libre aprovechamiento," in the free areas proclaimed by the government.

BRITISH GUIANA: During the first nine months of 1957, the Guianese "pork-knockers" found 169,080 diamonds weighing 20,650 carats. Assuming the same level of output to have prevailed during the last quarter, production for the year 1957 should be about 27,000 carats, a somewhat lower figure than that of the previous year.

OTHER PRODUCING COUNTRIES: INDONESIA (Borneo), INDIA, and AUSTRALIA are minor producers of little world importance, where diamond production tends to decline.

U.S.S.R. Something more is known about the recently discovered Siberian alluvial diamond fields and kimberlite pipes, The Russian Ministry of Geology, Moscow, published in 1957 the book "Almazi Sibiri" (Siberian Diamonds) a scientific work (price: 15 Rubles) of considerable geological interest. Three major diamondiferous pipes are mentioned, one in the Vilyui area, and two in the Daldyn area. In both pipes and alluvials, very few large stones are found, the greater part being extremely small diamonds and slivers. The average weight would appear to be about 0.07 carat, and about 80 percent of the total to be crushing board. Organized mining does not seem to have started.

The announcement from Johannesburg of the death of Sir Ernest Oppenheimer in November 1957 was received with regret throughout the mining industry. The late Sir Ernest was the outstanding figure in the world of diamonds and gold mining. He has been succeeded as chairman of De Beers and Anglo-American Corporation by his son, Mr. Harry Oppenheimer, M.P.

Mine Production of Diamonds by Countries in Metric Carats for 1955, 1956, and 1957 (Estimated)

Country	1955	1956	1957 (Est.)
Belgian Congo	13,041,487	14,010,455	15,645,000
South Africa	2,628,916	2,585,728	2,580,000
South West Africa	812,848	988,653	996,000
Ghana (Gold Coast)	2,258,270	2,539,428	3,000,000
Sierra Leone	418,077	549,091	875,000
Liberia (Exports)	203,544	1,025,034	850,000
Angola	743,378	740,035	860,000
Tanganyika	325,523	358,717	375,000
French Equat. Africa	136,960	145,840	110,000
French West Africa	318,450	389,700	220,000
Brazil (Estimated)	300,000	250,000	250,000
Venezuela	141,147	93,834	90,000
British Guiana	33,300	29,816	27,000
Other Countries	15,000	12,000	12,000
TOTALS	21,376,900	23,718,331	25,890,000

1. Excluding African diggings.

Shortly before his death, the late Sir Ernest, in his 1957 Christmas message to the people of Kimberley in "Diamond News", wrote:

"I am happy to say that the diamond industry continues to enjoy exceptional prosperity. The capacity of diamond mining companies cannot meet the sustained demand for gem stones; and, despite the end of stockpiling by the United States, sales of industrial diamonds have been well maintained. The industry's diamond research program continues to evolve new and improved methods of diamond recovery and also to find fresh outlets and uses for diamonds, thus widening the application of diamond tools."

OUTLOOK: The above message summarizes the outlook for the diamond mining industry. Diamond marketing is in strong hands, and a special reserve of £20,000,000 has been built up by the Diamond Corporation to ensure at all times the stability of the diamond industry and market.

If the shortage of diamonds is alleviated through increased production in the near future, black market prices, illicit dealing, and smuggling will gradually disappear, which will be a blessing to the industry.

As to the competition of stones of the synthetic variety manufactured by General Electric, tests made both in Europe and the United States seem to indicate that these minute grains, comparable in quality and size to crushed board, are suitable for use in resin-bonded wheels, but that for metal bonded or ceramic wheels and tools, natural crushing board, which is harder, is more efficient. Its price is also appreciably lower, and consumption and industrial applications are constantly expanding.

The mining industry considers for the present the synthetic industrial abrasive as an additional production of a commodity in short supply.

"The brisk, growing, and optimistic phase of the fluorspar industry is in the acid grade"



J. BLECHISEN
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Rosiclare, Illinois

Fluorspar consumption by the steel, aluminum, and chemicals industries reached an all-time high in 1957 of 660,000 tons, up 10 percent from 1956, and up 50 from 1950; this consumption rise was paralleled by the continuing sensational and increasing rise in foreign imports. During 1957, foreign imports, principally from Mexico, reached a top high of 620,000 tons, up 30 percent from 1956 and up 150 from 1950. Contrariwise, the situation of the domestic fluorspar producers continued to be confounded by the impact of rising imports and their declining percentage participation in United States' consuming market, when in 1957 domestic production totalled only 325,000 tons, down 2 percent from 1956, despite the domestic industry's current ore reserves and milling capacity substantially sufficient to meet consumption needs.

Fluorspar Consumption, Domestic Shipments, and Imports in Short Tons for 1950, 1956, and 1957

	1950	1956	1957
1. Consumption—of domestic and foreign origin	425,000	620,000	660,000
2. Domestic shipments*	300,000	330,000	325,000
a. Relationship of domestic shipments to consumption	75%	55%	50%
3. Foreign imports*	165,000	485,000	620,000
a. Relationship of foreign imports to consumption	40%	80%	95%

*NOTE: The total of domestic shipments and foreign imports, in any one year, exceeds 100% of consumption—the excess represents (a) inventory increases at consumer's plants, and (b) government stockpile shipments, not consumed.

Fluorspar is marketed in three commercial grades—*metallurgical* for steel and iron foundries; *acid* for aluminum, hydrofluoric acid, and the fluorine chemicals; and *ceramic* for glass and porcelain enamel. Of the 660,000 tons of fluorspar consumed in the United States in 1957, nearly 50 percent of it (320,000 tons) went into aluminum, hydrofluoric acid, and the fluorine chemicals; about 270,000 tons went into steel and iron foundry usage; and the remainder (70,000 tons) went into ceramics, glass, and other miscellaneous uses.

The brisk, growing, and optimistic phase of the fluorspar industry is in the *acid* grade. Of the 320,000 tons of acid grade fluorspar consumed in 1957, 110,000 tons of it went into aluminum, and the remaining 210,000 tons were used in producing 85,000 tons of hydrofluoric acid—which went into fluorocarbon chemicals, like DuPont's Freon, General Chemical's Genetron, and Penn Salt's Isotron, for propellants, refrigerants and fluorine resins; uranium and atomic energy processes; and elemental fluorine and high octane gasoline.

As to domestic production, here are 15 states which have figured historically in fluorspar production, and have fluorspar mineral areas: Arizona, California, Colorado, Idaho, Illinois, Kentucky, Montana, Nevada, New Hampshire, New Mexico, Tennessee, Texas, Utah, Washington, and Wyoming. However, only six states produced and shipped fluorspar in 1957:

(a) Southern Illinois and western Kentucky area (Illinois-Kentucky). This area accounted for nearly 200,000 tons of the total production in 1957, or 65 percent thereof.

(b) The four western states of Colorado, Montana, Utah, and Nevada. This area produced approximately 125,000 tons of fluorspar in 1957; Colorado and Montana accounted for approximately 50,000 tons each.

Foreign imports of fluorspar in 1957 equaled nearly 95 percent of America's consumption—620,000 tons of imports against 660,000 tons consumption. Foreign fluorspar came into the United States in 1957 from Spain, Germany, Canada, Italy, and Mexico, the latter accounting for approximately two-thirds of the foreign imports in 1957.

Substantial United States interests have fluorspar operations in Mexico, notably Penn Salt Company, American Smelting & Refining Company, Dow Chemical Company, and Reynolds

Metals Company, the latter having completed construction of a large acid-grade fluorspar mill in 1957 at Eagle Pass, Texas, where it beneficiates Mexican ore for use in its aluminum plants. Harshaw Chemical Company, an important hydrofluoric acid producer, erected its own drying plant in Cleveland, Ohio in 1957, where it dries and processes imported European fluorspar for its own account. Walter E. Seibert of the St. Lawrence Fluorspar Company also completed the erection of a fluorspar drying plant in Cleveland in 1957 to dry and process European acid-grade fluorspar for sale in the consuming market in the midwest.

There were four interesting and encouraging developments in the end uses of fluorspar announced in 1957.

(1). The possible use of fluorine as an oxidizing agent in high energy fuels for missiles—this being the latest and most engaging development in the fluorspar field. The California Institute of Technology is working on a fluorine (high energy fuel) program, and the National Advisory Committee for Aeronautics, Washington, D. C., has recently released several reports on fluorine as a rocket propellant, reports which have until now been classified and restricted.

(2). An expansion among the fluorocarbon producer is indicated by the scheduled entry into this field in 1958 of the Union Carbide Company which will produce fluorocarbons at Institute, West Virginia to compete with Freon, Genetron, and Isotron—these chemicals being used for propellants in pressurized containers, refrigerants in cooling systems, and fluoroplastics. Also, there is to be an enlargement of hydrofluoric acid facilities by a new plant addition in 1958 at Louisville, Kentucky of Stauffer Chemical Company, a present hydrofluoric acid producer.

(3). Hydrofluoric acid consumption used in the atomic energy program is scheduled for increase when General Chemical Company opens its UF_6 plant in 1959 at Metropolis, Illinois, where it will process U_3O_8 for the Atomic Energy Commission.

(4). Kaiser Aluminum entered into working arrangements in 1957 with leading phosphate rock processors for the acquisition of their fluorine byproducts to be used by it in the production of aluminum fluoride and artificial cryolite—essential electrolytes in the metallurgy of primary aluminum. This program, if successful, opens up the possibilities of deriving fluorine compounds from phosphate rock in adequate commercial quantities, and, if fully developed, may prove to be a substantial and continuing source of fluorine.

Also, major fluorspar operators and consumers were engaged in widespread fluorspar surveys during 1957. In the southern Illinois and western Kentucky area, at least five different geological survey teams made extensive investigations, and some of them are still in the area. In the western states of Colorado, Texas, California, and New Mexico, like geological survey teams worked during 1957.

Reasonable forecasts for 1960 suggest a fluorspar consumption in the United States of 1,000,000 tons.

Fluorspar Consumption by End Uses in Short Tons for 1950, 1956, and 1957 with Forecast for 1960

End Uses	1950	1956	1957	1960 Fore- cast*
Steel	240,000	265,000	270,000	335,000
Aluminum	55,000	110,000	110,000	175,000
Hydrofluoric acid—for	70,000	175,000	210,000	400,000
a. Uranium and Atomic Energy				
b. Fluorocarbons (Freon, Genetron, Isotron, etc.)				
c. High octane gasoline, elemental fluorine, and miscellaneous uses.				
Ceramic and other uses	60,000	70,000	70,000	90,000
Total consumption (000 - tons)	425,000	620,000	660,000	1,000,000

*Based (1) on the total of existing and projected steel capacity of 140,000,000 tons and primary aluminum capacity of 2,500,000 tons; (2) expansion of hydrofluoric acid usage (a) in uranium processing at A.E.C.'s six atomic energy plants, and at General Chemical's new uranium hexafluoride plant at Metropolis, Illinois, (b) in basic fluorocarbons (Freon, Genetron, Isotron, and Union Carbide's fluorocarbon not yet trade named), and (c) in high octane gasoline and elemental fluorine; and (3) increasing usage of fluorspar in porcelain enamel for building construction, and in miscellaneous fluoride salts.



HENRY G. GRUNDSTEDT
Manager Engineering
Services, Mining World

"It is encouraging to note that new gold mining developments are being actively carried on"

Gold again became more and more the topic of discussion with interested groups throughout the world in 1957. The hue and cry for an increase in the price of gold is presently stronger than ever, as is always the case during declining business conditions. Also, a condition of rising costs and a stable gold price, have forced all but a few of the major gold mines to shut down.

In the United States mine production of recoverable gold declined approximately three percent during 1957 for the second consecutive year. Among the principal gold-producing states small production gains were noted in Arizona, Nevada, and Washington; however, these gains were more than offset by reduced production in California, Colorado, and Montana. Gold production from South Dakota and Alaska were about the same in 1957 as they were in 1956.

South Dakota continued to rank as the leading United States gold producer, followed by Utah, Alaska, and California—the same order as in 1956. Over 75 percent of United States gold production came from these areas. Gold output of Alaska, California, and South Dakota was obtained by straight gold mining operations, while the balance of production was obtained as a byproduct of base-metal operations.

Total United States gold production for 1957 amounted to 1,768,624 ounces, as compared to a 1956 production of 1,865,200 ounces.

It is interesting to note that gold production in both Canada and Australia were up, due mainly to government support. And

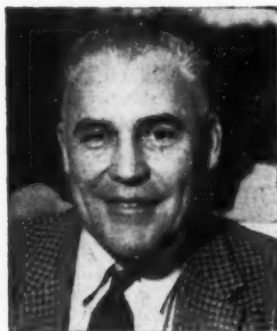
the Canadian government recently extended federal subsidies to mines for another two years, until December 31, 1960.

In Germany, complete convertibility of the Deutsche Mark is now a reality. Freedom has been restored to the German gold market as of April 1, 1957. Also, gold may be imported from any soft-currency country. As a result, Germans can buy as much gold as they can afford, and pay for it in D-Marks. According to German government reports, more than half of the 15,100,000,000 D-Marks (\$3,600,000,000) in circulation are now covered by gold deposits.

The sale of Russian gold is continuing in western markets. Official estimates place total sales of Russian gold in 1957 as some 4,300,000 ounces. Probably less than one third of the Soviet Union's annual production. Part of these sales were made on the Continent, mainly in Switzerland for transferable Sterling. But probably the larger part of this gold eventually found its way to London. Indirectly Russian sales of gold have given some relief for Britain's hard-pressed gold and dollar reserves. Such sales against transferable Sterling reduce the need for support of that type of Sterling by British authorities, and helped push up the value of the pound.

Even under present conditions of rising costs and a stable gold price, it is interesting to note that new gold mining developments are being actively carried on. At the Western Deep Levels Limited, about 50 miles west of Johannesburg, Union of South Africa, an outlay of \$56,000,000 will be made to sink a 12,000 foot shaft and to do other necessary work to bring this mine into production; to eventually produce gold worth approximately £800,000,000. Approximately six years will be required to bring the mine into full production.

Apparently some people still have confidence in the future of gold.



M. E. VOLIN
Director, Institute of Mineral
Research, Michigan College
of Mining and Technology,
Houghton, Michigan

"Will the search for iron switch from direct shipping ores to those readily beneficiated?"

The slow-down in some business activities that spread to other segments of United States economy as 1957 advanced, did not reach the iron ore industry until late in the year. By that time the Great Lakes shipping season was well along and it was a good season tonnage-wise; from the opening on April 9 to December 15, the closing date, 84,614,734 gross tons moved to the Lower Lake ports and steel centers. Mine production in all districts of the United States increased by about 11 percent over that of strike-crippled 1956. Domestic production of useable iron ore and agglomerates came to 105,386,000 gross tons in 1957, according to preliminary figures of the U. S. Bureau of Mines. Nearly 65 percent came from Minnesota, 13 from Michigan, a little under 2 from Wisconsin, and the rest from 13 other states. Production from the seven western states reached a new high level.

Imports of iron ore and agglomerates followed the established trend in reaching a new high level. The American Iron Ore Association reported total receipts of 33,911,922 gross tons of iron ores and agglomerates from foreign sources, a 14 percent increase over 1956 imports. Canadian shipments decreased 2 percent because of curtailment of production in some of the Lake Superior region mines, but imports from other countries jumped 25 percent. Nevertheless, Canada was the largest supplier and shipped a third of the imported iron

ores. Venezuela was in second place and scored the biggest increase in shipments. Chile, Peru, and Brazil were the other principal suppliers and all showed good gains.

More pellets and other agglomerates came to market, and more of the ores received some form of beneficiation before shipment. Thirty percent of all of the Lake Superior ores shipped in 1956 had received beneficiation or agglomeration while in 1957 these treated ores were estimated to make up over 40 percent of the total shipments. Six new beneficiation plants went into operation in Minnesota in 1957, bringing the total to 78 in that state. More of the ores were screened and sintered before being charged to the blast furnaces. Construction of new sintering plants in progress in 1957 will, upon completion, bring sintering capacity at the furnaces to approximately 50,000,000 annual tons.

This trend towards improved raw material iron started with the influx of the high-grade foreign ores and became further established when domestic pellets and other agglomerates arrived at the furnaces in appreciable tonnages. Furnaces that had yielded 7,500 tons of pig iron a week with the Lake Superior District shipping ores produced as much as 9,400 tons when charged with the high-grade ores, taconite pellets, or sintered agglomerates. This meant increased production without building more of the expensive blast furnaces. Furthermore, consumption of coke was lower, and other savings were realized through decreased slag volumes. All of these things added up to lower overall operating costs even though more money had to be spent in mining, beneficiating, and shipping the ores long distances. As a result, emphasis shifted from the cost of ore to the cost of the metal in the ladle. Now the furnace operators demand iron raw materials specifically

tailored with respect to grade and physical structure to give the best furnace productivities and economics. Is this the beginning of a revolution in iron ore production and smelting? Will even the better Lake Superior shipping ores have to be treated to improve their chemical analysis, structure, and size? Will the search for iron shift from direct shipping ores to those which can be readily beneficiated into premium quality raw materials?

The search for and development of new sources of iron ore to supplement the traditional Lake Superior production continued vigorously. Large beneficiation plants figured prominently in many of the Canadian developments. As hopes of finding high grade deposits diminished, attention turned to the large, low-grade deposits yielding ores that can be beneficiated by magnetic methods. Products running from 65 to 68 percent iron were desired to minimize the shipping costs in terms of iron units. At least one company was investigating more complex treatment methods for a reserve of enormous proportions. Several companies were busy in that great arc of iron formations extending from the west coast of Ungava Bay to the Mistassini Area of Quebec Province. Quebec Cartier Mining Company, a subsidiary of U. S. Steel Corporation, made plans for a beneficiation plant of 5,000,000 annual tons capacity to be installed at Mt. Wright, Quebec Province by 1961.

South America and other overseas countries had their share of iron ore developments, too. In Venezuela ore deposits near Cerro Bolivar and a new project at El Trueno were under consideration. A survey by the Brazilian Government revealed vast iron deposits in the state of Minas Gerais. High-grade hematite ores are mined there now, but the itabirites or low-grade ores must await new beneficiation techniques. A new mine being developed in Orissa Province, India, will start producing by 1960 from a reserve of 150,000,000 tons of ore averaging 54 to 65 percent iron.

The domestic iron ore industry had important developments too. Production of taconite was boosted materially when the new Erie Mining Company plant began initial operations late in 1957. The Reserve Mining Company's plant more than measured up to expectations in producing over 5,000,000 tons of pellets during the year. Michigan's two low-grade jasper plants and the Eagle Mills pelletizing plant were in steady operation. Hanna Coal and Ore Corporation started construction of another jasper plant at Groveland on the Menominee Range. Kaiser Steel Corporation continued a long-

range expansion program involving new furnaces at Fontana, California and a new jigging plant at the Eagle Mountain mine. U. S. Steel Corporation started testing an extensive low-grade deposit in Fremont County, Wyoming. Bethlehem Steel Company was near the production point at the Grace mine and 6,000-ton-a-day plant at Morgantown, Pennsylvania. Encouraging reports of exploration in Missouri by St. Joseph Lead Company held promise of a major development from which production of 2,000,000 tons a year was thought possible.

Among other things, 1957 was a year of increased emphasis on research. Direct reduction of iron ores came into the limelight again as a number of new processes were announced. Republic Steel Company and National Lead Company announced the R-N process which reduces both low- and high-grade ores in a rotary kiln with low-grade fuel. Bethlehem Steel and HydroCarbon Research Inc. reported their H-iron process to be near economic realization; it uses hydrogen for reduction and operates at high pressures. United States Steel Corporation is designing an experimental plant based on the Shipley patents. Arthur D. Little Inc. is developing a process based on Esso Research and Engineering Company patents. Julian Madaras has developed a retort for direct reduction. The Dwight-Lloyd division of McDowell Engineering Company, is building a pilot plant to demonstrate the Dwight-Lloyd-McWane process. The Freeman process has had wide publicity in Canada. The Krupp-Renn process seems to be gaining a limited but firm foothold where it fits into the economic picture.

As exploration reveals more about the iron formations of the Western Hemisphere, it is becoming apparent that there are important reserves of fine-grained hematitic ores that cannot meet specifications as direct shipping ores and need upgrading for the long transportation to market; yet these ores are beyond the reach of flotation or other established mineral beneficiation methods. One of the possibilities for treating these ores lies in reduction roasting to convert hematite to magnetite and thus make the ores amenable to low-cost magnetic separation. The metallurgy of this process is well understood but heat requirements and other factors make the cost too high for the production of iron ores. Research is being done to bring the magnetizing roasting method within economic reach of the iron ore industry.

Increasing research by the iron and steel industries has exciting implications of a new era in iron ore supply and iron making.



MARSHALL SITTIG
President and Managing
Director, American Lithium
Institute, Inc., Princeton,
New Jersey

With no new integrated production facilities put into operation in 1957, industry emphasis has been on broadening of product lines and concentration on marketing.

The basic facts of life in the lithium industry have become plain in 1957 and have divested the industry of some of the "glamour" which it had previously had. These are the facts:

1. There is plenty of lithium ore to supply the industry for many years to come and enough to supply almost any foreseeable demand.
2. The United States Atomic Energy Commission revealed in April 1957 that it was purchasing substantial amounts of virgin lithium hydroxide and were separating the isotope lithium-6 (7.5 percent of naturally-occurring lithium) from lithium-7 (92.5 percent of naturally-occurring lithium) and were returning the lithium-7 to a stockpile for repurchase by the suppliers. The quantities and end use of the lithium-6 remain highly classified.
3. Between the productive capacity of industry and the availability of the "tails" material from the A. E. C., the supply of lithium chemicals exceeds demand and provides an adequate guarantee of supply for future uses.

LITHIUM

"There is plenty of lithium ore to supply the industry for many years to come"

4. Lithium continues to be one of the more unique of all the 100-odd elements. This has been high-lighted in 1957 by new applications of lithium metal in heat-resistant aluminum alloys and as catalysts for the manufacture of new synthetic rubbers which duplicate the desirable physical properties of natural rubber.

Production and consumption statistics for the industry remain classified due to the A. E. C. purchasing situation. An authoritative breakdown of lithium chemicals end uses has been published in 1957 which reveals the following breakdown of sales:

Distribution of 1956 Lithium Chemicals Sales

Application	Percent of Civilian Sales
Lubricating greases	35.0
Ceramics and glass	27.8
Metallurgical and organic	14.7
Storage batteries and misc.	10.2
Air conditioning	7.3
Welding and brazing	5.0
	100.0

The year 1958 will see intensified sales efforts by all the major producers. The ever-growing volume of research results on lithium uses combined with price decreases for lithium chemicals announced late in 1957 should cause sales to reach an all-time high in 1958.

MANGANESE



F. A. MCGONIGLE
Vice President, Manganese,
Inc., New York, New York

***"The Butte program could last until mid-year
... carlot completed in less than two years"***

The manganese industry sustained its position most of 1957 but developed signs of a much lowered volume in 1958. Domestic mines shipped an estimated 350,000 short tons of plus-40 percent ore, or almost the same as the 1956 figure of 344,735 short tons. Domestic consumption at 2,350,000 short tons of ore, likewise, was not too much above the previous year's consumption of 2,240,000 short tons, so that again domestic mines supplied only 15.0 percent of United States requirements.

Ferromanganese, together with the other manganese alloys, registered a marked decline in production to parallel the drop in steel ingot output. The major plants curtailed ferro output and one small producer shut down. This condition forecasts both lowered consumption and acquisition of manganese ore in 1958, not only because steel requirements will be less, but also because present ore inventories have been automatically increased and thus ore purchases will be less in order to bring inventories into line.

Foreign ore price on a 46-48 percent basis with other usual terms were \$1.64-\$1.69 per long ton unit in January, but closed the year at \$1.36-\$1.39 per long ton unit with cash transactions about \$0.12 less per long ton unit. Ferromanganese had a maximum quote of \$275.00 and declined \$240.00-\$245.00 a net ton. Foreign ferromanganese could be obtained in December for about \$200.00 ex duty a net ton. Government (General Services Administration) prices were unchanged on the two domestic programs in effect.

The purchase of oxide and carbonate ores continued on the low-grade program at Butte, Montana. An estimated 1,850,000 long ton recoverable units in both types of ore were acquired to bring the total recoverable units on hand to 5,700,000. With the possibility that some additional units may be authorized, the Butte program could last until mid year. There was no activity at the Wenden, Deming, and El Paso low-grade stockpiles.

On the carlot program, an estimated 6,000,000 long ton units were delivered to the G.S.A. Total receipts through December 31, 1957, are estimated to be 16,538,173 long ton units out of 28,000,000 authorized. At the current acquisition rate, this program will be completed in less than two years.

India provided 24 percent of ore needs, but for the first time, in 1957, was supplanted as the principal supplier of ores to the United States, being relegated to second place by Brazil's figure of 30 percent. In Brazil the Amapa mine came into pro-

duction and shipped some 600,000 tons of 48 percent Mn ore to the United States. There were 24 countries from which ore was obtained.

In India, the State Trading Corporation continued to move into the ore exporting business and could very well take over the entire business in another year. The Corporation controls railway facilities as well as export permits. In several instances the Corporation did not meet its commitments and, to the detriment of its reputation and business volume, caused contract cancellations whereby purchasers obtained ore elsewhere at more favorable prices. Brazil, however, did not fall into line, even though its ore was offered. The Brazilian agency held out for around a \$1.45 a long ton unit with few takers, if any.

The failure of the grain crop in India brought about discussions with the United States Government whereby about 1,000,000 tons of wheat would be sent to India under Title I (P.L.480) for rupees, part under Title II (give away) and about \$30,000,000 under Title III (barter). Together with a small tonnage of ferromanganese, India would exchange for the wheat about 150,000 tons of 42 percent Mn ore with a balance of higher grade ore. At the moment it appears that this deal may go through, and if so may involve, as part of the barter, an ore exchange to Hungary for electric motors and an ore exchange with Yugoslavia for industrial equipment. Another effect of a successful barter would be to remove a considerable tonnage of Indian ore from the domestic market and probably prevent further depressed prices.

The USSR appears to have sold about 250,000 tons of high grade ore to England and Europe. None was offered to United States consumers either by sale or by barter. An undisclosed tonnage of ferromanganese and other alloys was sold in Europe by the Russians with a small tonnage of ferromanganese going to Japan.

Research and development work declined somewhat but the U. S. Bureau of Mines continued work on certain hydrometallurgical and pyrometallurgical projects. The Vitro Laboratories, Inc., worked with Government assistance on Colorado rhodonite ores with a hi-arc method. The Manganese Chemicals Corporation was in commercial production of battery grade MnO₂ and fine chemicals from the Cuyuna Range ores.

The future for a domestic manganese industry is bleak unless federal assistance is forthcoming. What is needed is a two fold program with authorized funds by Congress. The program should consist of a) a five year extension of the carlot program, and b) purchase by G.S.A. of domestic ore processed into manganese alloys, the G.S.A. paying the import price for the ore and the market tool price for processing, so that a useable product is obtained.

MERCURY



J. ELDON GILBERT,
Manager, Cordero Mining
Company, Palo Alto, Cali-
fornia

***"There are indications of some increase
in world consumption of mercury in 1957"***

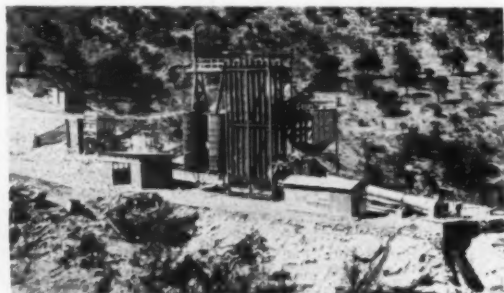
The world's excess production above consumption, which has consistently shown up in review figures of the world's mercury picture for the past several years, began to be felt in the market during 1957. Whereas during 1956 the price per flask sank from \$275 to \$255, and during 1957 it continued to drop from \$255 to \$225, this trend reflected different consumption situations. During 1956 world consumption was relatively high and

the price was set by the market; in contrast, the markets became saturated during 1957 and United States General Services Administration was forced to accept metal at a pre-set price of \$225 delivered to warehouses.

Domestic mercury production continued to increase, as it has each year during the past eight years. Estimated production for 1957 is 31,000 flasks. Much of this increase is coming from new operators of old mines. With the decrease in price, many if not all of the newcomers are wondering why they entered the field. Their actual entry into the mercury mining business took place two to four years ago when the entire picture, especially when viewed from the outside, had a definitely rosy hue. The price was much higher, and rumors of new exotic uses were rampant, especially defense uses. These rumors were

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strengthened somewhat by manipulation of government owned stockpiles, heavy secret buying of some government agency, and by the abrupt announcement by GSA of its purchase program—



George O. Argall, Jr.
Editor
Mining World

The domestic molybdenum industry in 1957 was characterized by greater production, decreased consumption, larger exports, a firm market price, and new producers planning output. These all made Molybdenum the Metal of 1957.

On the International scene total world production is estimated as the second highest annual output in history. Consumption outside the United States showed a slight increase.

Molybdenum Production again was and will continue for the foreseeable future to center at Climax, Colorado where Climax Molybdenum Company Division of American Metal Climax, Inc. operates the world's largest underground mine at the world's largest molybdenum deposit. Reserve figures published in 1957 were 418,000,000 tons averaging 0.43 percent MoS₅. Mine production and molybdenite recovered increased to 10,551,000 tons and 42,466,000 pounds in 1957—highest ore tonnage ever and highest molybdenite recovery in two years. Climax mined its 100,000,000 tons of ore on Feb. 4. Completion of new milling units, a larger number of underground draw points, and well trained employees enabled Climax to

a program which had as one of its goals the acquisition of 125,000 flasks from domestic mines at a time when this represented 10 times the annual domestic production. Authorization was also made to purchase 75,000 flasks of Mexican production.

During the late summer of 1957 the price fell to an equivalent of \$225 delivered to GSA depots and producers prepared to deliver to GSA. The producers were stymied, however, by having GSA insist on seamless flasks which did not exist and which no one was making. These flask specifications were eventually relaxed somewhat by redefining the word "seamless" to include flasks with seams if the seams did not show. The whole controversy took on an Alice in Wonderland aspect. In December GSA announced they would accept, as part of 1957 quota, metal produced in 1957 if delivered in suitable containers by March 31, 1958.

Among the producers the order of production may have changed somewhat during 1957 but the same mines that were the larger producers in 1956 still produced 90 percent of the metal with two-thirds of it coming from the following five mines (listed in probable order of contribution): New Idria mine, New Idria Mining and Chemical Company, San Benito County, California; Red Devil mine, DeCoursey Mountain Mining Company, Inc., Alaska; Cordero mine, Cordero Mining Company, McDermitt, Nevada; Abbott mine, California Quicksilver Mines, Inc., Williams, California; and Idaho-Almaden mine, Rare Metals Corporation of America, Weiser, Idaho.

There are indications of some increase in world consumption of mercury in 1957. Germany and Japan both reportedly are increasing their uses. India either bought some metal for immediate use or as part of their long-range plan for industrial growth. Mercury went to Brazil during the year, and several other countries increased purchases to some extent. In respect to Russia, the market situation became reversed! For years it has been assumed that mercury produced in the Free World had been quietly shipped behind the Iron Curtain. Suddenly, in 1957—the year of Sputnik—Russia apparently became self-sufficient in mercury, so much so that at least twice during the year there were reports of Russian metal for sale in European markets. Specific figures on consumption are difficult to obtain and are frequently in error.

World production figures can be accumulated with more accuracy and for 1957 they are impressive. Italy probably led in world production with about 65,000 and Spain following with about 60,000. Other major foreign producers with approximate production are: Mexico 20,000; Yugoslavia 12,500; Japan 7,000 and Philippines 3,400. These, added to United States, total about 200,000 flasks for the Free World production. The best ouija boards indicate that this production exceeds consumption by about 50,000 flasks.

MOLYBDENUM

*"In Canada exploration for molybdenum
reached record heights during the year"*

set this production record. Climax is planning for the future, too, and started construction of a new 34,000-ton-per-day by-product plant, a 320,000,000-ton tailing disposal area, and made preparations for a new underground circular shaft to the 1,000-foot level.

A strike at the Langeloth, Pennsylvania roasting plant made it necessary for Climax to ship concentrates to the idle roaster plant of Beattie-Duquesne Mines Limited at Duparquet, Quebec, Canada for treatment.

There was no production from the Questa, New Mexico mine of Molybdenum Corporation of America during 1957. This mine has been the second largest straight molybdenum producer for a number of years. However, a \$510,500 DMEA exploration contract was started during the year to prospect the upper level area of the mine in the hope of developing a large tonnage of low-grade ore which could be mined profitably by a mass mining system. At year's end the project had not progressed far enough to determine what the chances for such might be.

Straight molybdenum mine output was up 13 percent over 1956.

Byproduct Production from porphyry copper ores decreased about eight percent as less copper ore was mined following cut backs by major mines to bring supply closer to demand.

Kennecott Copper Corporation's Utah Copper Division was the largest byproduct and second largest producer again. During the year the mill heads averaged 0.50 percent MoS₅ (1.0 pound

per ton). According to reports the molybdenum content of the ore mined in recent years has declined.

San Manuel Copper Corporation's San Manuel mine made the greatest gain in byproduct as tonnage mined increased sharply over that for 1956. Output in 1957 was 1,452,080 pounds (591,970 in 1956) from 8,825,130 tons milled (0.16 pound or 0.008 percent per ton). San Manuel will not sell any of its output to the government as originally planned when the company received a government loan. However, the company announced early in 1958 that the MoS_2 content of the ore has been and is expected to be less than originally estimated, but may improve somewhat in future years.

The Morenci copper mine of Phelps Dodge Corporation produced 840 tons of molybdenite concentrate during the year. Other Arizona byproduct producers were Bagdad Copper Company, Silver Bell mine of American Smelting and Refining Company, and Miami Copper Company. Inspiration Consolidated Copper Company's new molybdenite flotation circuit was being installed at year's end. It is estimated that the \$561,132 cost will be returned within two years after production starts.

New Mexico's output was all from Kennecott Copper Corporation's Chino Mines. Union Carbide Nuclear Corporation's Pine Creek, California tungsten mine again produced byproduct molybdenum. With the rapid decline in tungsten price, ores with higher molybdenum and copper were mined.

Nevada shipments again came solely from the Nevada Mines of Kennecott Copper Corporation, and Consolidated Coppermines Corporation. However, Gatchell Mine, Inc. installed a molybdenum flotation circuit to recover byproduct sulphide molybdenum from tungsten ore mined at its Moly underground mine. Concentrates were produced but not marketed.

Foreign Developments centered in Canada where exploration for molybdenum reached record heights during the year.

Molybdenite Corporation of Canada Limited continued as the major producer. It mined and milled 169,601 tons averaging 0.46 percent MoS_2 from the La Corne mine. Ore reserves were maintained and the first full year's production of technical grade molybdenic oxide was achieved. The firm's nearby subsidiary—Preissac Molybdenite Mines Limited—estimated on dia-

Mine Production of Molybdenum in Pounds by Countries For 1953, 1954, 1955, 1956, and 1957

Country	1953	1954	1955	1956	1957
Canada	194,000	452,000	774,000	871,000	874,000
Chile	3,031,000	2,663,000	2,817,000	3,121,000	3,100,000
Japan	397,000	450,000	439,000	534,000	525,000
Republic of Korea	20,000	22,000	24,000	31,000	34,000
Mexico		159,000	55,000	33,000	40,000*
Norway	317,000	335,000	379,000	366,000	365,000
United States	57,243,000	58,668,000	61,781,000	57,462,000	60,830,000
Yugoslavia	1,920,000	441,000	948,000	800,000*	462,000*
Others	888,000	710,000	683,000	982,000	400,000
Total	63,800,000	63,900,000	67,900,000	63,200,000	66,630,000

* Estimated.

mond drill results that 1,000,000 tones of ore to a 500-foot depth had been developed. Funds are being raised to develop and equip the mine and build a 1,200-ton-per-day flotation plant.

Climax Molybdenum Company continued its active drill exploration campaign in British Columbia and investigated other prospects. On Boss mountain drilling continued in the molybdenite mineralized quartz diorite.

Other exploration campaigns for molybdenum were conducted by Sogemines Development Limited (Belgium) and Rio Canadian Exploration Limited (Rio Tinto Mining Company of Canada Limited) which formed Pidgeon Molybdenum Mines Limited to diamond drill favorable claims near Sioux Lookout, Ontario. Quebec Metallurgical Industries Limited drilled and drifted at the Kirkham mine near Shawville, Quebec. De Coursey-Brewis Minerals Limited owns claims near Sioux Lookout and plans exploration.

All of Chile's output was a byproduct of copper mined and milled by Kennecott's subsidiary, Braden Copper Company. At year's end work on the new byproduct circuit at Anaconda Company's Chuquicamata flotation plant was nearly completed. Important production will be made at this mine in 1958.

NICKEL

"The supply-demand situation throughout the world in 1958 should be in close balance"

DR. JOHN F. THOMPSON
Chairman of the Board, International Nickel Company of Canada, Limited, New York, New York



The year 1957 brought a turn-about in the supply-demand situation for nickel. After many years of nickel shortage for civilian purposes, the combined supply of market and premium price nickel came into close balance with demand in nearly all areas of the world during the last part of 1957. In fact, in the largest market, the United States, the supply exceeded the demand.

This change was brought about by a record high Free World production, sharply reduced defense demands, and the United States government's endeavor to divert to industry during the year all nickel scheduled for stockpile intake. The last two factors had the effect of greatly increasing the civilian supply in the United States. Some nickel was also released from the United Kingdom's stockpiles for distribution in that country.

Free World nickel supplies in 1957 were estimated at 490,000,000 pounds, compared with the previous high of approximately 450,000,000 pounds in 1956.

Deliveries of the metal by the several Canadian producers reached a new high total of about 360,000,000 pounds, representing approximately 75 percent of the Free World's entire supply. Of the balance available to the Free World, Cuba accounted for about 9 percent; United States, 4 percent, and New Caledonia, Japan, and others, 12 percent.

International Nickel, the world's largest producer, operated at capacity in 1957 for the eighth consecutive year. The company's deliveries, in all forms, exceeded 290,000,000 pounds, or about 5,000,000 pounds above 1956.

The year 1957 marked the first full year of development at

International Nickel's new project in northern Manitoba. In the Thompson-Moak Lake area 400 air miles north of Winnipeg, the company is opening a new nickel mining operation and building a smelter, mill, a modern town, and ultimately a refinery. A recent major development was the completion on October 20, 1957 of a 30-mile railway spur. This spur, linking the project's plant site area at Thompson with the Canadian National Railways' Hudson Bay line, now provides year-round transportation for men, equipment, and supplies.

The year saw the announcement of two other important projects which are aimed at increasing production capacity in future years. Freeport Sulphur Company announced that it will produce 50,000,000 pounds of nickel annually from its deposits at Moa Bay, Cuba, and the French nickel company, Le Nickel, with mines on the island of New Caledonia, disclosed plans to increase its output to 50,000,000 pounds or more per year.

Based on these programs and the announced expansion plans of other producers, it is expected the annual total Free World producing capacity in 1961 will approximate between 650,000,000 and 675,000,000 pounds, with much of the increase government stimulated or sponsored. Included in the estimated 1961 total production capacity is the output of the United States government-owned plant at Nicaro, Cuba, which is understood to have increased its production facilities to 50,000,000 pounds annually, and also that of such Canadian producers as Falconbridge Nickel Mines Limited and Sherritt Gordon Mines Limited which have announced that they will increase their respective productions to 55,000,000 and 25,000,000 pounds annually.

In conclusion, barring any presently unforeseen large increases in defense demands, it is expected that there will be more nickel available to the industries of the Free World in the coming year than was the case in 1957. The supply-demand situation throughout the world in 1958 should be in close balance, although some supplies offered during the year will continue at premium prices.

Copper, Lead, and Zinc in 1957

Capacity surges ahead of demand and industry applies brakes to production Long-range outlook is good Consumption will grow Research programs will develop new uses, slow substitution

COPPER

One word describes copper's situation in 1957—overproduction. Yet when all factors are considered, copper still has a bright future. Many producers are banking on this, because they are increasing world-wide capacity by 32 percent in the next five years.

In the United States these conditions prevailed during 1957. Mine production of recoverable copper declined 3 percent from the 1956 total. Apparent consumption of refined copper for the first 11 months of the year was off 11 percent from the corresponding period in 1956. Import of copper in unmanufactured form for the first 11 months of 1957 was up 2 percent over the 1956 corresponding period. Exports during the first 11 months were up 75 percent. When 1957 opened, copper was priced at \$0.36 per pound. When the year closed, copper was priced at \$0.27 per pound. Producers' stocks of refined and blister copper and copper in process of refining were up 26 and 4 percent, respectively.

In assessing the copper picture in 1957, one should keep these points in mind. Copper output was exceeded only by the all-time high registered in 1956 and in the war years of 1942 and 1943. Another significant feature was the high rate of deliveries of copper to foreign fabricators in 1957. The foreign fabricators markedly increased their exports to the United States. In recent years the United States demand for fabricated products has been met almost entirely by domestic fabricators. During 1957, however, copper wire and copper and brass sheet and tube from European and Canadian mills entered the United States in substantial amounts. Thus the apparent consumption reported in the table may be lower than actual consumption of copper in the United States in 1957.

Still another bright spot is noted in the copper picture. According to one responsible company official, consumption rose on a world-wide basis; 1956 consumption was 3 percent above 1955; 1957 consumption was up 2 percent over 1956.

Most domestic producers curtailed production in order to bring supply and demand back in balance. During the year production cuts were announced by Phelps Dodge Corporation, The Anaconda Company, Inspiration Consolidated Copper Company, Miami Copper Company, Calumet & Hecla, Inc., Pima Mining Company, and Kennecott Copper Corporation. Most of the cutbacks were effected by reducing the work week and elimination of overtime. At year's end, cuts announced by the Big Three, Kennecott, Phelps Dodge, and Anaconda, at domestic properties amounted to roughly 9,700 tons per month. Total United States curtailment at the end of the year approximated 11,900 tons per month. The output from new mines and expanded facilities in the United States largely offset many of these cuts in 1957.

Elsewhere in the world, the Chilean Copper Department authorized a 10 percent reduction in output for 1958 based on

Preliminary Copper Industry Statistics for 1957

	1956	1957 ¹
New Copper produced from domestic ores from		
Mines	1,106,215	1,076,922
Smelters	1,117,580	1,081,000
Refineries	1,080,207	1,046,000
New copper produced from foreign ores and mattes	362,426	404,000
Total new refined copper	1,442,633	1,450,000
Secondary copper	468,489	437,000
Imports (unmanufactured and refined)	787,492	696,573 ¹
Exports of (metallic and refined)	503,678	721,766 ¹
Stocks at end of year	339,000	370,000
Apparent consumption of new refined copper	1,367,000	1,250,000
Total refined copper (actual)	1,521,389 ²	1,249,000

1. Preliminary estimates by U.S. Bureau of Mines
2. January to November inclusive

1956 tonnage. Overall production of copper in Chile in 1956 was 452,000 metric tons. In 1957 copper output from the three American controlled mines in Chile amounted to 434,480 metric tons. It was reported that Union Minière du Haut Katanga initiated a 10 percent cut in production near the end of the year. This would amount to about 2,300 tons of copper per month. Plans to reduce production were announced by Roan Antelope Copper Mines, Ltd., and Mufulira Copper Mines, Ltd. in Northern Rhodesia. A similar announcement was also made by Cerro de Pasco Corporation.

Based on new or only recently completed expansion plans and new mine projects, the next 5 years will see a 12½ percent growth in copper capacity over that available in 1957. This represents a whopping increase of 32 percent over 1955 capacity. Since 1955, expansion projects were scheduled at White Pine, Inspiration Consolidated Copper Company, The Anaconda Company at Butte, and Ray Mines Division of Kennecott Copper Corporation. In Canada, expansion projects were carried on at Campbell, Chibugamu, and Gaspe.

New mine projects are underway all over the world. In the United States Pima Mining Company reached production in 1957. Duvall Sulphur & Potash Company's new mine south of Tucson is scheduled for output early in 1959. In Canada new mine projects underway since 1955 included Willroy, Consolidated Sudbury, Tilt Cove, Heath Steele, Rainville, and Chicks.

In Chile, development is underway by The Anaconda Company on the El Salvador; the company's Africana mine was put into production in 1957. In Peru, a big development is underway at Toquepala by Southern Peru Copper Company. New mines are being developed in Europe in Ireland, and Yugoslavia.

Last year, a major producer estimated that presently developed and indicated reserves of copper in the Free World totaled approximately 165,000,000 tons of metal. If current world consumption is assumed to be 3,000,000 tons of copper per year, the Free World reserves represent a 55-year supply of copper. A breakdown of the reserves according to location are shown in a table accompanying this report.

What's the outlook for copper for the year ahead? A great deal depends on what the economy does. Opinions have been expressed by many responsible authorities that fabricators of copper products have been living off inventories for the past six to eight months. Administration and congressional efforts to spur the overall economy in 1958 should increase copper demand. With the cutbacks now in effect, any increase in demand should result in a substantial drop in industry stocks. One source cautiously said that the price of copper will rise in 1958. His prediction was based on industry efforts to balance supply and demand, and possible termination of the now-suspended copper import tax in June 1958. If Congress refuses to extend the duty-suspension, slated to end June 30, an import tax of \$0.017 per pound will become effective whenever copper is priced at \$0.24 per pound or over. If the average price of copper falls below \$0.24 per pound for a calendar month be-

Free World Copper Mine Capacity and Projected Increase for the Next 5 Years. Figures Reported in Thousands of Short Tons.

Year	USA		Outside USA		Total	
	Tons	Increase Over 1955	Tons	Increase Over 1955	Tons	Increase Over 1955
1955	1,014†		1,997†		2,982	
1956	1,130*	116	2,183*	186	3,313	302
1957	1,190	176	2,315	318	3,505	494
1958	1,226	212	2,391	394	3,617	606
1959	1,237	223	2,444	447	3,681	670
1960	1,244	230	2,578	581	3,822	811
1961	1,278	264	2,652	655	3,930	919
1962	1,278	264	2,666	669	3,944	933

† Copper & Brass Research Association estimate based on first 10 months
* American Bureau of Metal Statistics reports

* American Bureau of Metal Statistics

tween now and June 30, a \$0.02 per pound duty becomes effective; the peril-point clause will remain in force following June 30 unless changed by new legislation.

What kind of a price does the domestic producer want for his copper? Apparently the range is about \$0.30 per pound. Small copper producers are clamoring for the imposition of an increased import tax and a higher peril-point for copper. Bills have been introduced in both the House and Senate to establish a \$0.04 per pound tariff on the copper contained in copper-

bearing ores and concentrates whenever the price of the metal is below \$0.30 per pound.

Prevailing opinion holds that an import tax, if granted, will help bolster the price. But one noted authority acidly commented, "The London Metal Exchange is an international currency gambling casino with nonferrous metals as chips. The minutes we withdraw support from foreign currencies, metal and ore will come in here (the U.S.) at almost any price differential."

LEAD

There is no denying that 1957 was a hard year for lead. Production was down, imports soared, and consumption declined in the United States. One bright spot prevailed, however. Consumption of lead abroad during 1957 held at the high level of about 1,300,000 tons which had been reached in 1956. With all foreign nations striving for a better standard of living, this trend should continue.

A second important development was noted in 1957. This consisted of a cooperative agreement between domestic and foreign lead producers to undertake a broad, world-wide, joint research program. Though increased research will have no effect on the immediate outlook, the principle is fundamental to a healthy industry over the long-run.

Production of recoverable lead from domestic mines decreased to 333,500 tons in 1957, a decline of nearly 6 percent below the total registered in 1956. Running against this overall pattern were the states of Missouri and Idaho. Lead output was up 1 percent in Missouri and jumped 9 percent in Idaho. Arizona, Virginia, Colorado, and Washington also recorded increases.

Elsewhere in the United States production declines were noted. Output in Oklahoma was down 47 percent; Kansas production was off 44 percent; Montana output declined 29 percent; and Utah mines produced 11 percent less lead than in 1956.

The dominant factor in the lead market in 1957 was the United States government. It had been apparent for several years that a situation of top-heavy supply existed. The surplus failed to depress the market price due to the United States' military stockpile program and the barter of agricultural products which removed some of the excess production from normal trade channels. Both programs served to prop the price of lead.

Though the government continued stockpiling during 1957, the rate of procurement was considerably below the 1956 level. It has been estimated that 5,000 tons of lead each month was acquired for the military stockpile in 1957. In 1956, nearly twice as much lead went into the stockpile.

The surplus of lead was accentuated by the British government's announcement in January 1957, that it intended to dispose of 30,000 tons of lead from its strategic stocks. Though the disposal covered a 9-month period from March through November 1957, it added to the general condition of over-supply. In December 1957 the United Kingdom decided to dispose of another 20,000 tons of lead at a monthly rate of 1,200 tons.

In the meantime, imports of lead in pig, ore, and concentrates were pouring into the United States at a fast pace. It's estimated that 515,000 tons of lead was brought into the country in 1957. This represented an approximate increase of 7 percent over the 1956 period. The net result of world over-production, reduced domestic consumption, and a slower United States stockpiling rate was that lead stocks piled up in the hands of producers and consumers.

The domestic producers sought relief. The administration sent to Congress the long-range minerals program which incorporated sliding-scale import taxes for both lead and zinc. Congress failed to act on the proposal before it adjourned and tossed the problem back to the administration. In September the domestic producers, through the Emergency Lead-Zinc Committee petitioned the Tariff Commission for maximum permissible increase in tariff rates. In the case of pig lead, this would result in increasing the present tariff from 1 1/16 cents per pound to 2.55 cents per pound. The Emergency Lead-Zinc Committee also asked for the imposition of import quotas.

Preliminary Lead Industry Statistics for 1957

	1956 (Tons)	1957 ¹ (Tons)
United States mine production	352,800	334,000
Imports into U. S.	479,875	515,000
Production of secondary lead in U. S.	506,800	500,000
Foreign mine production	1,600,000	1,700,000
United States consumption of lead	1,209,717	1,145,000
Foreign consumption of lead	1,151,000	1,300,000

1. Estimates are based on levels attained in first 11 months and the extrapolated to full-year basis.

The domestic producer would like to see the price of lead stabilized at \$0.16 to \$0.17 per pound. When asked what prices they wanted for metals, the replies varied from a low of \$0.295 to a high of \$0.31 per pound combined lead-zinc.

In the United States, lead consumption during 1957 was slightly disappointing. Preliminary estimates place usage in 1957 6.5 percent below 1956. Lead lost ground to plastics and aluminum in one of its main markets—cable sheathing. The metal also suffered an approximate 9 percent decline in use for tetraethyl lead. This could be accounted for, in part, by lower gasoline consumption in 1957. What the effect of new catalytic cracking plants will be on lead consumption remains to be seen. These plants reportedly produce better gasoline which requires less tetraethyl lead. The use of lead in storage batteries showed a slight drop.

Based on an estimated domestic lead consumption of 1,125,000 tons per year, the Emergency Lead-Zinc Committee believes that annual imports of lead should be about 240,000 tons. This is less than half the metal imported during 1957. To maintain a healthy domestic industry, the Committee opinion is that United States mine production should contribute 385,000 tons yearly to lead consumers. The remaining 500,000 tons of lead for a 1,125,000-ton yearly consumption would normally be available from scrap says the Committee.

The outlook for lead in 1958 is shrouded with uncertainty. Production will be less due to the low price. This should exert some corrective influence on the basic problem of over-supply. The general level of the United States economy during the year will exert a powerful influence on the market. Most predictions are for more housing starts, and this could benefit consumption favorably. Industrial expansion will be down, however, and it follows that consumption of lead will be off in this field. Producers feel that the lead position will improve slightly by the end of the year.

One of the great unknowns regarding the lead market is the status of the United States government stockpiling program. Some industry observers expect stockpiling of lead to terminate at mid-year. Others think that up to 150,000 tons of lead will move into the stockpile. Estimates place the total lead now held in the stockpile in excess of 1,000,000 tons. It is no secret that the government is taking a long, hard look at the stockpile program. When will it end? Worse yet, will steps be taken to dispose of any of the material held in the stockpile?

One of the future bright spots for lead is an anticipated growing use of the metal abroad. Foreign consumption held up well in 1957. Lead has been mentioned prominently in applications for radiation shielding and for use in ceramics. Future growth in these fields hold considerable promise for increased consumption.

ZINC

The American Zinc Institute called 1957 one of the better consuming years for the zinc industry. Best long-range news for the producer during 1957 was the growing recognition of the value of fundamental and applied research as a direct

approach for market expansion. The most important public announcement was the introduction of the widely heralded Long-Range Minerals Program. It was termed by some, "an insult to the industry"; it was hailed as a major victory by

others, due to administration recognition of the excise tax principle. Most important presentation of the year was the testimony of the Emergency Lead-Zinc Committee before the Tariff Commission.

Technically, the most important development of 1957 was the zinc blast furnace of Imperial Smelting Company at Avonmouth, England (reported in MINING WORLD, October 1957).

For the miner, troubled with foreign imports of zinc it was a hard year. When the year opened, the zinc price was \$0.135 per pound, East St. Louis, and domestic production was rolling along at a higher average rate than in 1956. By July the price had dropped to \$0.10 per pound; many mines were forced to close or curtail activities. When asked to predict zinc's price movement in 1958, one authority cautiously said he expected some increase. Another flatly stated the price would rise in the second quarter of 1958.

The zinc industry won't get any more help by government stockpiling. The Office of Defense Mobilization is closing the zinc stockpile at the end of April 1958.

Domestic mines produced 520,100 tons of recoverable zinc in 1957, according to the U. S. Bureau of Mines. There was a noticeable shift by area in the production pattern. Both New York and Tennessee registered all-time production highs in 1957. The combined zinc output of states east of the Mississippi showed an 11 percent gain over 1956. On the other hand, production from the Tri-State district dropped 47 percent under 1956 figures; this area was the largest producer in the United States for 60 years prior to 1950. Zinc output in the western states declined 5 percent in 1957 compared to 1956. This shift in area production is expected to continue. The reason is simple. New mine developments are scheduled in Tennessee, Pennsylvania, and Virginia. None are slated for the Tri-State or West at this time.

Ore output during the first four months of 1957 was greater than the 1956 average monthly production rate. In the last half of 1957, mine production dwindled to 228,500 tons, 22 percent less than the 291,600 tons produced in the first half of 1957.

Over-expansion of the world-wide zinc industry has been a major problem since the end of the Korean War. The effects of excess productive capacity had been dampened by United States government acquisition of zinc for the military stockpile program and by exchange of agricultural products. In April of 1957 there were indications that federal officials were closely scrutinizing the stockpile program. The barter of agricultural products was temporarily suspended. Later barter was reinstituted but on a sharply restricted basis. The net effect of these developments combined to break the market price.

The United States government continued military stockpiling of zinc. But Simon Strauss, vice president of American Smelting & Refining Company, publicly stated that the pace of these acquisitions in 1957 was far below 1956. His estimate: 20,000 tons of zinc moved into the military stockpile each month in 1956; and in 1957 only 10,000 tons monthly were acquired for stockpile. It is believed that the quantity of zinc in the stockpile is substantially in excess of the 300,000-ton goal originally established by President Eisenhower when he announced the program in 1954. It is commonly stated in the trade that the quantity of zinc in the stockpile tops 1,000,000 tons.

Both barter and stockpiling helped maintain the price of zinc during 1956 and in the early part of 1957, by taking some of the excess production off the market. But it was inevitable that stocks would begin piling up in producers' hands. A basic problem of the domestic zinc miner is that zinc ore can be mined and shipped to this country at a lower cost than the American producer can afford to operate. Solutions to the import question were sought. The administration took the lead in proposing a tariff increase to Congress. Congress, however, failed to act before adjournment.

In September 1957 the National Emergency Lead-Zinc Committee asked the Tariff Commission for relief under the escape clause of the Trade Agreements Extension Act.

It's a well known fact that zinc imports are needed in the

Preliminary Zinc Industry Statistics for 1957

	1956 (Tons)	1957 (Tons)	Percent Change 1957 vs 1956
Mine production ^{1,2}	542,340	520,128	- 4
Slab zinc production ^{2,3}	1,062,954	1,057,450	- 1/2
Total slab shipments ^{2,3}	1,035,311	959,568	- 8
Shipments domestic ^{2,3}	869,270	765,132	- 12
Shipments gov't Acct. ^{2,3}	157,014	179,466	+ 14
Shipments export ^{2,3}	9,027	14,970	+ 66
Stocks at smelters ^{2,3}	68,622	166,655	+ 142
Stocks at consumers ^{2,3}	93,896	72,111	- 23
Consumption ^{2,3}	818,601	780,047	- 5

1. U. S. Bureau of Mines. 2. American Zinc Institute, Inc. 3 Full year.
4. December 31. 5. October 31. 6. January to October.

United States. This country simply can't produce all of the metal that it needs. The Emergency Lead-Zinc Committee generally agreed that the following levels were necessary to sustain a healthy domestic zinc industry: Production of zinc contained in newly mined ore—600,000 tons annually; production of zinc from secondary metal—100,000 tons per year; required imports of zinc in metal or ore—400,000 tons per year. These estimates are based on a domestic consumption of 1,100,000 tons of zinc per year in the United States.

In presenting the industry case to the Tariff Commission, the Emergency Lead-Zinc asked for maximum tariff relief under existing laws and for the imposition of import quotas on zinc contained in ore, concentrate, pig, slab, and in manufactured or semi-finished products. The Tariff Commission rejected arguments favoring import quotas for zinc in semi-finished or finished products. It heard only testimony regarding quotas for ore, concentrate, and slab.

The maximum relief now available to the zinc industry under existing law is an increase of the tariff on slab zinc to \$0.021 per pound. The current tariff now applicable to slab zinc is \$0.007 per pound.

What about zinc's future and what will be the long-range pattern? Examination of past consumption records show that historically zinc consumption curves have followed peaks and valleys. There is little evidence to indicate that the years of 1956 and 1957 were not normal consuming years, says the American Zinc Institute. Slab zinc consumption in the United States, Canada, and Sweden was down slightly. Consumption in Europe, Mexico, Australia, and India was considerably higher in 1957 based on preliminary estimates. It is interesting to note that overall consumption of zinc during 1957 was 1 percent higher in the 13 countries shown in Table No. 2.

In the United States, estimated slab zinc consumption for 1957 was 936,000 tons, down 7 percent from the 1,008,790 tons consumed in 1956. For the first time in history, consumption of zinc for die casting exceeded the zinc consumed for galvanizing purposes. A big drop in the use of zinc for galvanizing was noted during 1957. There is little data, however, to indicate that substitution of competitive steel-coating processes was responsible for the drop. Nor was the drop in galvanizing accounted for by decreased steel production. It can only be assumed that the relatively small use of zinc for galvanizing which prevailed in 1957 is only, therefore, a temporary situation.

With a situation of over-supply and a slight reduction in consumption prevailing in the United States, stocks of zinc in producers' hands grew during the year. At the beginning of 1957, producers held 68,622 tons of zinc; at the end of the year, this figure had grown to 166,665 tons.

The zinc industry, through the American Zinc Institute, is currently in the process of arranging for a major expansion in research activities. The program is aimed at the consolidation and expansion of existing markets and the discovery of new ones. A staff is being formed to supervise the program. The next step, according to the American Zinc Institute, will be the broad placement of research and development projects in research centers, universities, and engineering schools.

What about the long term outlook for zinc? Two factors combine to make future growth in the industry look attractive. Over the long run consumption of zinc has steadily grown. In the United States the increasing population trend should promote further increase in zinc consumption. Abroad, both population growth and per capita consumption of zinc are expected to grow. A steadily increasing drive by under developed nations to increase living standards is taking place. Any increase in living standard is bound to result in increased use of zinc, and all other metals for that matter. One official said that zinc consumption will increase about 5 percent a year in the United States. He expected foreign consumption to show an even greater growth.

The outlook for 1958 is closely tied to the general level of industrial activity which will prevail. If this is true it appears that use of zinc during the first half of the year will be slightly lower than in the last half of 1957. Prevailing economic predictions are for an upturn in the economy in the second half of 1958. It follows that zinc consumption should show a gain in the last half of 1958 if the predictions hold true.

One thing is certain. At current price levels zinc is a cheap raw material in comparison to potential competing substances. The price will sooner or later influence consumption.

Slab Zinc Consumption in Certain Countries in Tons¹

Country	1956 Consumption Jan.-Sept. incl.	1957 Consumption Jan.-Sept. incl.	Percent Change 1957 vs 1956
United States	723,900	692,200	- 4
Canada	43,600	37,400	- 14
Mexico	12,300	12,900	+ 5
Denmark	3,200	4,200	+ 31
France	105,000	116,100	+ 10
Fed. Rep. of Germany	174,900	181,700	+ 4
Italy	42,000	56,300	+ 34
Netherlands	14,800	21,300	+ 44
Sweden	21,000	16,900	- 20
Switzerland	7,900	9,400	+ 19
United Kingdom	188,800	192,000	+ 2
Australia	55,400	64,700	+ 17
India	29,600	35,400	+ 20
Total	1,422,400	1,440,500	+ 1

1. American Bureau of Metal Statistics.



RICHARD J. O'HEIR,
Secretary-Treasurer, Perlite
Institute, New York, New
York.

Sales of expanded perlite—the white, ultra-lightweight aggregate that is replacing heavier sand in plaster and is being used increasingly in insulating concrete—are estimated to have held firm in 1957 with a dollar volume of \$13,200,000. The sustained level of perlite sales was achieved in spite of a decline in the building materials industry. Output of the expanded volcanic lava, produced by 84 plants of 72 companies in 30 states, also maintained a level of 260,000 short tons.

Perlite mines are operated by 12 companies in California, Nevada, Colorado, New Mexico, Oregon, and Arizona.

Foreign countries are also showing increasing interest in developing their perlite resources. As evidence of this, the Perlite Institute has member companies in Canada, Mexico, Venezuela, Germany, Great Britain, Greece, Japan, Australia and New Zealand, and expects to add to this list in 1958.

A new record was set in 1957 as perlite became the nation's most popular plaster aggregate. Latest statistics show that 53 percent of all plaster applied in the United States used perlite as the aggregate, compared with 44 percent in 1955.

For 1958, perlite sales will hold their 1957 level since only slight increases in public and private construction are expected and 85 percent of perlite sales are to the building industry. There are, however, several strong trends indicating highly favorable long-term growth prospects for the perlite industry, he notes.

First, there is a steadily rising demand by nurseries and home gardeners for perlite as a soil conditioner and as a

PERLITE

**"A new record in 1957 as perlite became
the nation's most popular plaster aggregate"**

plant rooting and shipping medium. This represents a fairly new field for perlite, with a vast sales potential indicated. Continuing university research programs are expected to result in more extensive horticultural uses.

A second trend is the ever-continuing use of perlite plaster which provides greater fire resistance and better insulation with less than half the weight of sand plaster.

Third, there is a greater demand for perlite insulating concrete, particularly for light structural roof deck constructions where it adds insulation and fire safety and reduces dead loads. Other important perlite concrete applications include insulation under radiant floor heating systems, lightweight floor fills in multiple story buildings, and for curtain wall back-up systems.

Fourth, increases are also expected in the use of perlite as a component of acoustical plaster and tile, insulation board, precast concrete sections, and other manufactured products.

Growth of the United States Perlite Industry From 1947 Through 1957

Year	Crude Perlite Sold and Used by Crude Producers Short Tons	Value	Expanded Perlite Sold Short Tons	Value
1947 ¹	10,450	\$ 58,000	7,700	\$ 271,000
1948 ¹	22,100	134,000	18,600	742,000
1949 ¹	71,100	510,000	52,200	2,385,000
1950 ¹	101,536	649,162	86,962	4,471,383
1951 ¹	153,502	858,099	133,175	7,243,298
1952 ¹	164,845	873,054	154,503	7,997,731
1953 ¹	198,751	1,439,658	174,461	8,894,735
1954 ¹	219,703	1,762,100	195,499	10,278,745
1955 ¹	286,157	2,281,632	246,343	12,585,297
1956 ²	307,000	2,490,000	265,000	13,382,000
1957 ²	307,000	2,500,000	260,000	13,200,000

1. Figures from U.S. Bureau of Mines, Mineral Industry Survey.
2. Estimate of Perlite Institute.



G. DONALD EMIGH
Director of Mining, Mon-
santo Chemical Company,
St. Louis, Missouri

World production of phosphate high-grade rock and concentrates for 1957 is about 30,000,000 long tons—down perhaps 1,000,000 tons from 1956. Notable among new production outside the United States was the start of a mining and milling operation at Recife, Brazil, which will produce over 200,000 tons a year. Operations in Morocco were relatively steady after the concern of a year or two ago that the Moroccans might remove the French operators of the nationalized mines. In Baja California, Mexico, the M. A. Hanna Company is reported to be proceeding actively with the development of low-grade deposits.

United States production was about 15,400,000 long tons. This is about the same as 1956—being either up or down 5 percent depending on the source of figures used. The 10 years prior to 1957 show a yearly increase of 7 percent. Adverse weather conditions early in the year, coupled with the general declining economy late in the year, had an adverse effect on fertilizer sales. The elemental phosphorus industry was not affected to the same extent with a modern decrease in the West and an increase in Tennessee.

PHOSPHATE

**"The phosphate industry will continue to show
a moderately steady growth in the future"**

The phosphate industry will continue to show a moderately steady growth in the future. Florida will continue its dominance as a producer, and probably increase its proportion of production. Largely because of its adverse location freight-wise, the West, for some years at least, will probably slip proportionately in production.

The year saw publicized a new phosphate field in Beaufort County, North Carolina. Several companies have been looking into the field with Bear Creek Mining Company most active to date. Mineability of the phosphate sands is one of the major problems to be resolved.

Estimated production in long tons by fields was: Florida, 11,300,000; West, 2,000,000; Tennessee, 2,100,000.

Following are highlights of 1957 phosphate mining operations in the United States:

FLORIDA: American Agricultural Chemical Company operated its South Pierce and Boyette mines and plants.

American Cyanamid Company shut down Saddle Creek mine and started Orange Park. Operations continue at the Sidney mine. The company in May started the new triple superphosphate plant at Brewster.

Armour Fertilizer Works completed its second year of mining operations at its new Bartow mine.

Coronet Phosphate Company, a division of Smith-Douglas Company, operated its Tenoroc mine at Lakeland. Their potassium silicofluoride facilities were enlarged.

Davison Chemical Company, a division of W. R. Grace & Company, operated the Pauway and Bonnie mines. Swift & Company operated the Varn and Watson mines. International Minerals & Chemical Corporation shut down the Peace Valley mine and operated the Achan and Noralyn mines. At its Bonnie plant sulfuric acid facilities were doubled. Kaiser Aluminum and Chemical Company is taking the fluoride waste material.

Virginia-Carolina Chemical Corporation operated the Homeland and Clear Springs mines. They started shipments of fluoride waste from the fertilizer plant to Kaiser Aluminum and Chemical's plant at Mulberry.

TENNESSEE: 93 percent of Tennessee phosphate rock production goes into the electric furnace industry. The three furnace operators are Shea Chemical Company, Victor Chemical Works, and Monsanto Chemical Company. There were no major changes in their facilities but some increase in capacity. International Minerals & Chemical Corporation operated at Wales producing rock for direct application and as electric furnace feed. The firm's Mt. Pleasant and Godwin facilities were largely inactive.

Virginia-Carolina Chemical Corporation operated its Mt. Pleasant mine and fertilizer plant.

WEST: Slightly over half of western rock production went into the electric furnace industry.

Montana Phosphate Products Company continued surface and underground operations at the Anderson mine near Garrison, Montana. There was limited production from the Luke mine. The Relyea underground mine near Garrison, Montana, operated most of the year.

Victor Chemical Works operated its underground Canyon Creek and Maiden Rock (Anderson) mines located south of its electric furnace plant at Silver Bow, Montana.

J. R. Simplot Company conducted summer open-pit mining operations at the new Centennial mine located on the Idaho-Montana line. Production goes to Canada and was increased over 1956. This company also operated its open-pit Gay mine near Pocatello, Idaho, shipping rock to its own fertilizer plant at Pocatello, and to Westvaco Mineral Products Division of Food Machinery and Chemical Corporation's electric furnace plant at Pocatello.

Monsanto Chemical Company conducted summer open-pit operations as its Ballard mine near Soda Springs, Idaho. The rock is trucked to its electric furnace plant at Soda Springs. During the summer The Anaconda Company mined open-pit at its Conda mine near Soda Springs. The ore was milled and concentrates shipped to the fertilizer plant at Anaconda, Montana.

San Francisco Chemical Company carried on summer open-pit mining operations at the Waterloo mine near Montpelier, Idaho. The company continued mining operations at its Lefe mine near Sage Junction, Wyoming. A new wet beneficiation plant was placed in operation there in the fall. Underground operations were also carried on by the company in the Crawford Mountains of Utah at the Arikaree and Cherokee mines. The company continued development work on phosphate near Vernal, Utah.

Central Farmers Fertilizer Company, a mid-western co-operative, began construction of an electric furnace plant in Georgetown Canyon. Development also started on open-pit mining facilities near the plant.

POTASH

"All indications point to a continuing increase in demand for potash, both at home and abroad"



NELSON C. WHITE
Vice President, Potash Division,
International Minerals
& Chemical Corporation,
Chicago, Illinois

Potash industry results for 1957 might be summarized as so many others have been—a good year but marked by a sharp down-turn in the last quarter. A more detailed study marks it as differing considerably from the pattern of the recent past and so mixed as to make predictions for the future, at least the short-term future, more difficult than usual. Reactions in the world market affected imports and exports with resulting effects on domestic business. Farm legislation, the general farm economy, and over-all economic pressures had their effects, with the last item probably the dominant one during the last quarter. A new pricing system was introduced by one producer in an attempt to prevent peaking of shipments in the early spring and a subsequent flurry in prices finally stabilized at a lower level.

Production in 1957 by United States producers continued to increase over previous years. 2,300,000 tons of K_2O were produced—a figure 6 percent above last year's totals. Deliveries by United States producers also increased over 1956, totalling 2,141,000 tons K_2O , an increase of 2 percent. Some 208,000 tons of K_2O were exported mainly to the Far East and South America. North American consumption of potash totalled 2,140,000 tons—about equal to the total shipments of the domestic producers, with imports from Europe just about balancing exports by domestic producers.

In spite of further reductions in farm acreage and a slight decrease in real farm income during the year, the use of potash in fertilizer manufacture equalled last year's tonnage. During the last quarter raw materials backed up in the plants of the primary producers. Since the trend to a more seasonal shipping season has been accelerating over the past several years, one producer introduced a new pricing schedule at the start of the contract season which offered inducements for off-peak shipments. Variations of the original schedule were offered by other producers and prices were fluid for a period of several weeks in June and July. They finally stabilized some

3 percent below 1956 levels but also included a differential in prices between coarse and regular forms of muriate, a return to a practice discontinued several years ago.

A substantial increase in available production occurred with the start of operation of National Potash Company's Carlsbad, New Mexico, plant in January. The older United States producers in the Carlsbad district—Potash Company of America, Duval Sulphur and Potash Company, International Minerals & Chemical Corporation, Southwest Potash Company, and United States Borax and Chemical Corporation—together with Bonneville, Ltd. at Wendover, Utah concentrated their efforts on improving operating efficiencies and their ability to produce more of the coarse sizes of muriate. Farm Chemical Resources Development Corporation completed a shaft near Carlsbad near the end of the year. They are now doing development on ore processing and design on the balance of the plant. In Canada, Potash Company of America carried its shaft to a depth of approximately 2,400 feet and was well started on the construction of a refinery and other surface facilities by the end of the year. Completion of the project is scheduled for late 1958. International Minerals & Chemical Corporation let contracts for the sinking of a shaft and construction of refinery at Esterhazy. 300 feet of shaft had been sunk by the end of the year and some surface installations built. Completion is scheduled for late 1959.

The long-term future of North American potash (Canada included) is relatively safe to predict. All indications point to a continuing increase in demand for potash, both at home and abroad. Most sources agree that this increase will average 5 percent annually. The quality of the American deposits and the demonstrated efficiencies of the domestic producers should enable them to improve their position in the world market. Though the trend may be a relatively straight line, the year by year actuals will, of course, vary from it. The past year saw some sharp competition for export business between European producers, resulting in lowered prices in some parts of the world supplied by them. Russian production is also appearing in world markets at very low indicated (barter deal) prices. The short-term effects of these and other factors make predictions for next year rather difficult. It does, however, seem safe to assume that, barring an unexpected decline in the economy, 1958 should match 1957 in both production and shipments.

"Rockets, jets and nuclear energy spur new interest in many relatively obscure metals"

Our rapidly expanding scientific frontiers are pushing specifications for alloys beyond limits now attainable with conventional materials. A great drive is on to develop new alloys to meet the requirements of nuclear energy and the space age. Industry is responding by making available ultra-pure metals. The techniques of vacuum metallurgy, zone melting, arc refining, and ion exchange are yielding metals where impurities are measured in parts per million. The pure elements are showing surprising and unpredicted properties. It is to many of the little known elements, now available for the first time in pure form, that science is turning in the quest for better materials.

BISMUTH is being examined for possible application as a liquid-metal, reactor coolant in the atomic energy field. Its low melting point and high boiling point make it look attractive from this standpoint. Most other uses of bismuth depend on a couple of unique characteristics. It expands on freezing and shows very little shrinkage on cooling. These properties are modified by alloying constituents. Some bismuth alloys containing lead, expand on freezing and grow during and after cooling to room temperature.

Preliminary data indicates consumption of bismuth was about 1,600,000 pounds in 1957, about 6 percent above 1956. Total world production was estimated at 4,800,000 pounds in 1957. Nearly 25 percent of domestic bismuth consumption was in pharmaceuticals and most of the remainder was used in fuse metal, solder, and other alloys. Spokesmen from Cerro de Pasco Corporation say the outlook for bismuth alloys is bright. The company has sufficiently large resources of bismuth in Peru to make it a major producer. In connection with atomic energy, some of the anticipated future need for bismuth will be for metal of high purity. Even Cerro de Pasco bismuth, which contains less than 15 parts per million total impurities, is not considered sufficiently free of contaminants for these purposes.

CADMIUM has important nuclear applications due to its ability to absorb neutrons. An interesting product developed during the year is a nickel-cadmium miniature battery. Its outstanding feature is that it can be recharged. If properly designed into the circuit, the nickel-cadmium button cell can be recharged by plugging the unit into a standard wall outlet.

Production of cadmium metal in the United States during 1957 amounted to about 10,540,000 pounds. Most of it was recovered from zinc smelting operations or from imported Mexican, cadmium-bearing, flue dust.

COLUMBIUM-TANTALUM received a great deal of attention in 1957. Heretofore, commercial use of columbium was primarily confined to application as a carbide stabilizer in stainless steels. Now it is being examined for a whole range of high temperature alloys—2,500 to 3,000° F. range. Among its desirable properties are good tensile strength at high temperatures and high corrosion resistance. Potential applications of this metal are being rapidly advanced by the availability of columbium of extreme high purity in commercial quantities.

In atomic energy, columbium is interesting because of its low neutron cross section; it does not suffer radiation damage.

At the present time over 99 percent of United States production of columbite-tantalite concentrates originate from Porter Bros. Corporation's dredging operation at Bear Valley, Idaho. Production from domestic pegmatites was insignificant in 1957. Reliable production statistics are lacking. In 1956, world production of columbium-tantalum amounted to about 9,640,000 pounds of which 80 percent came from Africa. Nigeria supplied nearly 60 percent of the output. In 1957 it is estimated that Nigeria produced about 1,750 tons of columbite, which represents a substantial reduction from 1956 output.

In 1956 the United States government terminated a purchase program for columbium-tantalum concentrate. The sudden end of government purchases, caught the industry with capacity well in excess of demand. So little was known of the two metals that they have been thought of as rare in occurrence. But in reality large reserves exist—mainly on foreign soil. One authority last year said that actual reserves in North America are in excess of the total combined known reserves of nickel and molybdenum. Most of these reserves are in Canada; the only domestic source now worked is the Bear Valley, Idaho operation. Large reserves of pyrochlore are known to exist in Africa, Brazil, and Norway. Present Nigerian production is obtained as a by-product from tin mining.

RARE EARTHS were mined in the United States at Molybdenum Corporation of America's bastnaesite deposit at Mountain Pass, California. Rare earths were also recovered as by-products from the South Carolina ilmenite-rutile operation of Heavy Minerals Company, and from the euxenite-columbite dredging operations of Porter Bros. Corporation at Bear Valley, Idaho. Monazite, imported from South Africa, was the primary source of rare earth raw materials and thorium production in the United States in 1957.

It was reported that total annual sales of rare earth chemicals are in the vicinity of \$10,000,000. Three firms dominate production of metals and chemicals, but several others are actively investigating production possibilities. Processors of ores or concentrates last year included Lindsay Chemical Company, Heavy Minerals Company, Davison Chemical Company and Mallinckrodt Chemical Works.

Gadolinium, samarium, and europium salts have a high nuclear cross-section and absorb neutrons. The thermal neutron cross sections for these materials are said to be higher than cadmium, boron, and hafnium, which have been used widely in reactor-control components.

Supply of rare earths certainly doesn't represent a problem; they are abundantly available all over the world. The major problem is development of markets to support potential production facilities.

SEMI-CONDUCTORS include selenium, germanium, and silicon. Until 1956, selenium was in critically short supply, but this was not the case in 1957. Last year was characterized by high production and a sharp decline in consumption. Major use of selenium is in rectifiers, and here it lost ground to both germanium and silicon. Selenium price at the start of 1957 was quoted at \$12.00 per pound for commercial grade and \$15.00 per pound for high-purity grade. At the end of the year the prices had dropped to \$7.50 and \$10.50 respectively, for the two grades.

Interest grew in super-pure silicon last year for semi-conductor applications. Domestic production last year was estimated at about 30,000 pounds, with DuPont accounting for the major proportion. W. R. Grace & Company announced that it was teaming up with the French firm, Pechiney, to produce ultra-pure silicon. Aries Laboratories of New York announced a new process for producing ultra-pure silicon.

Germanium, largely recovered as a by-product from Tri-State zinc ores, continued to score gains in the electronic industry.

MAGNESIUM production hit a peace-time high in 1957. Total output for the year was estimated at about 80,000 tons, close to industry capacity of 82,000 tons annually. Consumption was down in 1957 as a result of decreasing military aircraft programs.

All domestic production was obtained from 3 plants; two were operated by Dow Chemical Company where magnesium was recovered from sea water. Nelco Metals, Inc. operated the third primary plant at Canaan, Connecticut, where a silico-thermic process is used.

ZIRCONIUM expansion continued in 1957. Stimulated by contractual commitments with the Atomic Energy Commission, producers boosted output from about 470,000 pounds in 1956 to something over 2,000,000 pounds in 1957. The trend will continue in 1958, when additional new facilities will be completed or reach peak capacity.

Here is a brief review of activities. Carborundum Company, pioneer producer, operated the 325,000-pound (annual capacity) plant at Akron, New York; it completed a 1,200,000-pound capacity plant in West Virginia. Wah Chang Corporation turned out about 300,000 pounds of sponge at facilities in Albany, Oregon, leased from the United States Bureau of Mines. It completed a second plant at Albany in March 1957; this was initially rated at 300,000 pounds per year, but has since been expanded to nearly 500,000 pounds per year.

Most interest in the metal centers on hafnium-free zirconium. It has a low neutron cross section (absorbs few neutrons) which makes it useful in atomic reactor construction, and as a cladding element for reactor fuels. Non-nuclear applications of zirconium are expected to grow too. One authority predicted a non-nuclear consumption of 500 tons of zirconium within the next 5 years.

PLATINUM situation changed in 1957. In last year's Cata-

log, Survey & Directory edition we reported demand was brisk in 1956. In 1957, production mounted and demand fell-off somewhat. The result was a decline in price from \$103 to \$105

per ounce to \$77.00 to \$80.00 per ounce at the end of the year. The major market continued to be oil refining where platinum is used as a catalyst in making high-octane gasoline.

SILVER



ROSS D. LEISK
Consulting Mining Engineer,
Spokane, Washington

"Domestic producers are well aware of the ceiling price effect of Treasury sales to industry"

The statistical data presented below involve some degree of approximation due to the fact that official figures on production, consumption, and imports are incomplete for December and due also to the fact that substantial quantities of Lend Lease silver returned, or in process of being returned, in the latter part of 1957 had not been credited on the books of the United States Treasury Department when year end balances were struck on December 31st. Adjustments have been made, by estimate, to bring all data to a December 31st closing date, and while final figures will vary somewhat from those used, the deviations will not be sufficient to alter any conclusions drawn as to indicated trends.

Production of silver in the United States in 1957 is estimated at 37,895,336 ounces, compared with a final figure of 38,700,000 ounces in 1956. Western Hemisphere production is estimated at 145,000,000 ounces as compared with 145,800,000 ounces in 1956. Production outside of the Western Hemisphere is estimated at 78,000,000 ounces compared with 76,600,000 ounces in 1956, making a total estimated world production for 1957 of 223,000,000 ounces compared with 222,400,000 ounces for 1956.

World consumption of silver in the arts and industries is estimated at 210,000,000 ounces compared with 211,500,000 ounces in 1956. The usage in the arts and industries in the United States was 95,000,000 ounces, a decline of 5,000,000 ounces from 1956, but this was largely offset by an increase of 4,200,000 ounces in West Germany in 1957. It is of particular interest to note that there has been a steady rise in consumption of silver in the arts and industries in West Germany from 1953, when 11,900,000 ounces were used, to 1957 when the quantity consumed was 45,000,000 ounces. This puts West Germany in second place as a consumer of silver by a wide margin.

World consumption of silver for coinage purposes, exclusive of the United States, is estimated at 28,000,000 ounces in 1957 compared with 30,000,000 ounces in 1956. United States coinage requirements amounting to 51,400,000 ounces in 1957 and 31,100,000 ounces in 1956 are excluded from the comparison because these requirements are met by withdrawals from Treasury stocks of unpledged silver bullion and have no impact on the market. The combined consumption, arts, industries and coinage, exclusive of United States coinage, therefore, was 238,000,000 ounces in 1957 compared with 241,500,000 ounces in 1956.

If the world production totals for 1957 and 1956 are reduced by the amounts of newly mined domestic production delivered to the United States Treasury, namely an estimated 7,000,000 ounces in 1957 and 15,600,000 ounces in 1956, the effective world production available to the market becomes 216,000,000 ounces in 1957, and 206,800,000 ounces in 1956, so that the excess of world consumption, exclusive of United States coinage, appears to have been 22,000,000 ounces in 1957 and 34,700,000 ounces in 1956. Such a condition inevitably puts upward pressure on open market prices because it means that the excess silver must be obtained from other than current productive sources. The sources available are secondary, or reclaimed silver, reserves of demonetized coin held by foreign governments, current production of United States mines after the price passes 90.5¢ per ounce, and finally United States Treasury stocks of "free silver" in practically unlimited quantities after the price reaches the equivalent of 91.0¢ per ounce f.o.b. San Francisco, California mint. While the Treasury "free silver" is not available for export, its sale to United States industry has the effect of releasing other silver to meet the demands of the world market.

As might be expected the conditions set forth above con-

tribute to a very stable market and a narrow bracket of price fluctuation. Sellers of silver hold out for prices very close to 90.5¢. If demand pushes the price above 90.5¢, it becomes advantageous for United States mines to sell on the open market, instead of to the Treasury. If the addition of domestic mine production does not satisfy demand and the price edges past 91.0¢, the "free silver" spigot at the Treasury opens more or less automatically and this effectively quenches any further rise in price. Then, with demand temporarily satisfied by Treasury silver, the price tends to decline. If it falls below 90.5¢, domestic mine production is no longer offered on the open market, and as soon as this creates a shortage, the cycle starts over again. The published price in New York in 1957 ranged between a high of 91¢ early in the year, and a low of 89¢ in mid December. The price range in 1956 was between 91½¢ high, and 90¢ low.

The Treasury stocks of "Free Silver Bullion" were reported to be 127,400,000 ounces on December 31, 1957, a gain of 40,000,000 ounces from December 31, 1956. The increase represents Lend Lease silver credited, together with seigniorage and some minor acquisitions, reduced by 48,100,000 ounces used for subsidiary coinage and 3,800,000 ounces sold to industry. An estimated 180,000,000 ounces of Lend Lease silver was in process of being returned but not yet credited, leaving a balance of 22,300,000 ounces due from Saudi Arabia and 5,400,000 ounces due from Ethiopia. The due date for return of Lend Lease silver from these two countries has been extended to April, 1959.

The potential reserve of "free silver" available to the Treasury as of December 31, 1957 including the 27,700,000 ounces due in April, 1959 appears to be about 338,000,000 ounces. As long as this reserve is available to domestic consumers at 91¢ per ounce f.o.b. San Francisco mint which is equivalent to 92½¢ New York, the price cannot be expected to rise above this figure. While the reserve is large, it will eventually be used up and when it is gone, the Treasury will have to buy silver on the open market to meet requirements for subsidiary coinage. It is logical to assume that the cost of replenishing Treasury reserves will be well above 91¢ per ounce and this raises a question as to whether it is in the public interest for the Treasury to continue selling to industry at 91¢.

Prior to the Act of July 31, 1946 the Treasury could not sell silver from the general fund for less than its coinage value of \$1.2929 per ounce. Due to wartime disruptions and restrictions, silver consumers had experienced difficulty in obtaining enough silver to meet their needs during the 1941-1946 period, and the 1946 Act provided relief from this situation by authorizing the Secretary of the Treasury to sell silver held in the Treasury's general fund at such prices as in his discretion he might determine, but not less than 90¢ per ounce. When the initial price of 91¢ was set by the Treasury it was about 10¢ per ounce higher than the world market price. Domestic producers feel that the intent of the 1946 Act would have been better served if the Secretary of the Treasury had used his discretionary authority to maintain a substantial differential in the Treasury selling price over the open market price. Domestic producers have become increasingly aware of the ceiling price effect of Treasury sales to industry and late in November one major producing organization prepared an excellent memorandum on this subject for submission to the Secretary of the Treasury.

There was no new silver legislation in 1957. The usual bills calling for repeal of all silver purchase legislation were introduced in the house and senate but were not reported out of committee.

In summary there were no significant changes in production or consumption of silver from the previous year. Price patterns were essentially unchanged and the very narrow range of fluctuation of the past two years may be expected to continue for a long time in the future unless the Treasury's pricing policy on sales to industry is changed or unless the authority of the Treasury to deplete its reserves of "free silver" is removed by legislative action.



A. J. DICKINSON
Vice President, Freeport
Sulphur Company, New
York, New York

"Three new Frasch mines were under development: one in Texas and two in Louisiana"

Not since the years of shortage in 1951 and 1952 has the United States sulphur industry received as much attention from the press as it did in 1957, a year marked by increased competition, price reductions, a dip in both demand and production, and construction of new productive facilities.

In 1957 the leveling off in the steel, fertilizer, paper, rayon, and other industries resulted in a small decline in the use of sulphur, although consumption nevertheless held at near-record heights. On the basis of preliminary figures, consumption of sulphur in all forms in the United States was down between three and four percentage points from the high of 5,780,000 long tons consumed in 1956.

The production of sulphur from all sources in this country was estimated at approximately 6,900,000 tons, compared with 7,820,000 tons in 1956. Sulphur mined by the Frasch hot water process from the mines in Louisiana and Texas accounted for an estimated 5,500,000 tons. Of the remainder, 525,000 tons represented elemental sulphur recovered from gases, 425,000 tons sulphur contained in pyrite, and 450,000 tons sulphur in other forms. In addition, the domestic supply was augmented by about 640,000 tons of sulphur in various forms imported from Mexico and Canada.

The Mexican sulphur had for some time been offered at substantially under the United States price scale. To meet competitive conditions, Texas Gulf Sulphur Company in September announced a decrease of \$3.00 a ton in its prices and

this move was followed by similar action by other domestic producers. The new prices of U. S. Frasch sulphur were quoted at \$25.00 a ton f.o.b. port for bright sulphur and \$24.00 a ton for the dark product. Trade publications later published lower price quotations for Mexican sulphur but subsequently they announced an increase in Mexican prices to \$24.00 a ton f.o.b. port for the filtered dark product and \$23.00 a ton for unfiltered.

Texas Gulf Sulphur remained the largest producer, operating Boling dome and two other mines in Texas. Freeport Sulphur Company, the second largest, produced from four mines in Louisiana, while Jefferson Lake Sulphur Company worked two in Texas and one in Louisiana, and Duval Sulphur and Potash Company mined one deposit in Texas. A 12th mine, the Damon property of Standard Sulphur Company in Texas, was closed down in April 1957.

Three new Frasch mines were under development: one in Texas and two in Louisiana. The Fannet, Texas, plant of Texas Gulf Sulphur was completed and production was scheduled to begin early in 1958. In Louisiana, Freeport began construction of its Lake Pelto and Grand Island projects. Grand Isle ranks as a discovery of major magnitude and it will mark the first completely offshore sulphur mine ever undertaken. Located in the Gulf of Mexico in 45 feet of water six miles from the nearest land, it will incorporate many unique features designed to make it one of the industry's most efficient operations.

Eight new plans to obtain sulphur from other than salt dome deposits were completed or under construction during the year, and productive capacity of three existing facilities was being expanded. The total new productive capacity of these projects, including those not yet completed, is estimated at about 275,000 tons annually.



R. M. MACINTOSH
Manager, Tin Research In-
stitute, Inc., Columbus, Ohio

"It appears probable that 1958 Tin consumption in the United States will be above 50,000 tons"

The tin mining industry in 1957 maintained stable conditions with slightly lower world mine production which was matched by a moderate drop in consumption. The two major producing areas, Malaya and Indonesia, showed about the same percentage decrease bringing them more in line with production a year or two ago.

According to estimates by the International Tin Council, the Soviet Union exported between 8,000 and 9,000 tons of tin. It has since been established that the Russian tin does not meet the standards of Grade A tin and that most of the tin found a market in Europe.

Consumption of tin throughout the world in 1957 suffered

Country	1954	1955	1956	1957
Malaya	60,691	61,245	62,295	59,293
Indonesia	35,861	33,368	31,874	27,725
Bolivia	28,824	27,920	26,849	26,550
Belgian Congo	15,084	15,208	14,533	13,449
Thailand	9,776	10,970	11,723	13,310
Nigeria	7,927	8,159	9,054	9,745
Others	—	20,130	18,172	20,900
Total World	158,163	177,000	174,500	170,972

to some extent from the declining activity in many parts of the economy in the United States in the last quarter of the year. This decline, as far as tin was concerned, was not as depressing as had been forecast in some quarters.

One significant change in ore handling is promised for 1958. Arrangements have been made to smelt Indonesian tin concentrates at the Texas City, Texas, smelter which was acquired by the Wah Chang Corporation from the federal government one year ago. The furnaces have been rebuilt and sufficient capacity is available to handle a considerable tonnage of concentrates. This action will be welcomed by many people who believe it is in this country's interest to maintain a tin smelter in operating condition.

In view of the supply and demand picture, the International Tin Council, acting under the International Tin Agreement, has imposed export quotas on the tin producing countries for the first half of 1958.

The general outlook for world tin consumption in 1958 is difficult to assess since the consumption of tin is closely related to industrial activity. It is the general belief that there may be some slight falling off in consumption in the United States and in the United Kingdom during the first part of 1958. This may be offset in the other parts of the world where the trend is still upwards.

Steel production in the United States will be down but tinplate is likely to hold its position with further expansion of production facilities because there has been no falling off in the sale of canned goods. It appears probable that 1958 tin consumption in the United States will be above 50,000 tons, and may even be higher.

TITANIUM

"Balanced supply and demand must come from increased military use in aircraft and missiles"



D. W. KAUFMANN
Manager, Titanium Sales,
Crucible Steel Company of
America, Midland, Pennsylv-
vania

Titanium, still only five years old as a tonnage metal, and indebted to Defense Department needs for its rapid expansion, is still suffering acute growing pains. The year 1957 illustrated this in graphic fashion.

At the end of 1956 the demand for titanium mill products exceeded capacity. The advanced supersonic fighter planes and the intercontinental bombers required tons of titanium, particularly in the compressors of the jet engines. In fact, so badly were titanium sheet and forgings needed for such applications that the missile designers were discouraged from looking to the strength-weight contribution of titanium alloys for their needs. Five thousand tons of mill product were shipped in 1956; 10,000 to 12,000 tons were foreseen as the need for 1957.

Then, even as the titanium producers expanded under forced draft, the requirements of the Defense Department changed very drastically. Military aircraft programs were phased out, extended, or abandoned. Titanium forecasts were revised frequently, always downward.

When the dust had settled, titanium was in serious oversupply. Shipments of mill products in 1957 were about half of the earlier estimates.

In view of this, what is the outlook for the titanium industry?

It appears that the demand for titanium during 1958 will be considerably below 1957. However, the long range future of the industry continues to be bright. First, while other new metals and alloys have deservedly received a great deal of attention and marked improvements made in the use of steels in aircraft construction, in the long view the ore situation is extremely favorable to titanium. In fact, in the next decade, it appears that shortages of high-grade ore will force the price of engineering metals higher and higher. Magnesium and titanium appear to be the only exceptions to this rule.

In addition to existing in ample supply—ample domestic supply—it might be added that the mining and beneficiation of titanium ore has been proven by the large titanium dioxide industry. Two principal types of deposits exist in the United

States, the solid rock type such as the McIntyre deposit in New York state and the alluvial deposits which extend south from Georgia such as the Trail Ridge deposit in Florida. Both types yield to quick and easy beneficiation.

Next, while the separation of titanium into metallic form (sponge) is admittedly not easy, substantial progress is being made. This is clearly indicated by the price trends. In December of 1956, A-1 titanium sponge was priced at \$3.00 per pound; A-2 sponge at \$2.70. In June, 1957, prices were down to \$2.25 and \$2.00. Six leading companies (Cramet, Inc.; Dow Chemical Company; E. I. duPont de Nemours & Company, Inc.; Mallory-Sharon Metals, Inc.; Titanium Metals Corporation of America; Electro Metallurgical Company, Division of Union Carbide Corporation) are currently producing titanium sponge.

In the mill product field, while the demand fell far short of anticipated requirements, there was also ground for long-range optimism. Substantial reductions have been made in the selling price of sheet, bar, and other semi-finished forms. Concurrently, 1957 marked the beginning of a healthy diversification of the use of titanium. The largest single requirement in 1957 exceeded 30,000 pounds and stemmed from the use of large-scale titanium equipment in the Freeport Sulphur Company's nickel recovery plant at Moa Bay, Cuba. Although industry figures are not available, it is estimated that shipments for commercial (non-military) uses increased by at least a factor of five over 1956.

While commercial demands are certain to increase during 1958, they cannot be expected to take up the large amount of idle melting capacity. Balanced supply and demand must come from increased military use in aircraft and missiles programs. New higher strength titanium alloys, now supplied with guaranteed heat treated properties, certainly appear to answer many important requirements of missile design.

The titanium industry appears to be in a transitional stage of temporary over supply. Long-range predictions for a healthy growth are based on a favorable domestic ore supply, on substantial technical progress in winning methods, resulting in lower prices, and on diversification of the markets of the mill product producers, particularly titanium's growth as a material of construction in the chemical process industries during the past year.

TUNGSTEN

"The work on developing new tungsten alloys is scheduled to continue through 1958"



KEITH KUNZE
General Superintendent,
Getchell Mine, Inc., Gol-
conda, Nevada

The tungsten situation in 1957 is best described as "catastrophic."

High hopes were held by the domestic tungsten producers in early 1957 that the 85th Congress would appropriate sufficient funds to implement Public Law 733 for the purchase of approximately 1,000,000 units of concentrates during fiscal year 1957-1958. P. L. 733, passed by the 84th Congress, was designed to maintain a healthy domestic tungsten mining industry during the transition from a government stockpiling economy to the competitive world tungsten market. Unfortunately, a six-month fight developed in Congress over the appropriation measure, during which time the major tungsten producers continued to operate. When all efforts of the pro-

mining Congressmen were defeated by the House Appropriation sub-committee, headed by Representative Michael Kirwan of Ohio, in July, the domestic mines had accumulated stockpiles of approximately 250,000 units.

The repudiation of its 'moral obligation' under PL 733 by Congress was a devastating blow to the tungsten industry. The situation was further aggravated by the distressed position of foreign producers. The loss of United States markets, plus the termination of four major government contracts with foreign producers during 1957, had an additional depressing effect on the market. Several foreign countries, such as Bolivia, Portugal, and Republic of Korea, in critical straits for "dollar exchange," offered concentrate on a "cash at any cost" basis. The net result was that by the end of 1957 tungsten concentrates were being sold below production cost throughout the world.

Paradoxically, the consumption of tungsten was almost the same during 1957 as in 1956. This was achieved in spite of a drop in consumption during the same period of most other ferro-alloys, and is indicative of a trend on which tungsten producers pin their hopes for the future.

Tungsten Concentrate Consumption, Production, and Imports in United States in Pounds in 1955, 1956, and 1957

Year	Consumption	Domestic Production	Imports
1955	8,967,000	15,833,000	20,700,000
1956	9,061,000	14,761,000	20,860,000
1957*	8,600,000	7,550,000	13,400,000

* Latest estimate.

DPA Foreign Tungsten Purchase Program

Company	Short Ton Units WO ₃	Dollars
Republic of Korea	975,000	\$ 63,375,000
Wah Chang Corp.	315,546	20,706,799
Beral Tin & Wolfram, Ltd.	273,000	15,398,500
Minerales de Compostella	137,924	7,666,420
Compania Minera Moctezuma	128,836	6,570,636
British Italian Trading Co.	74,622	4,733,138
Korean Tungsten Mining Co.	73,424	4,554,416
Phillip Bros., Inc.	47,928	2,827,702
Derby & Co., Inc.	42,669	2,434,023
Compania Minera Celta	42,990	2,364,450
Abdon Merlatet	46,800	2,363,400
Metallurg, Inc.	32,851	2,032,558
Metal Traders, Inc.	24,005	1,523,247
Minerales y Metales S. R. L.	20,838	1,458,660
Continental Ore Corp.	22,650	1,443,175
Total all other companies	365,066	20,070,869
Total Program	2,624,179	\$159,542,993

The high rate of tungsten consumption, coupled with an indicated expansion in the field of the jet plane, missile, gas turbine, and atomic energy programs, has been the most encouraging factor in the otherwise gloomy tungsten picture.

Unless some unexpected demand occurs, the domestic market for the next year will probably be controlled by the three or four domestic mines still operating, plus some low-cost or government-sponsored foreign production. Two factors that will have a definite effect on the tungsten market in 1958 are: (1) the scheduled expansion of the byproduct plant of Climax Molybdenum Company at Climax, Colorado from the present

DPA Domestic Purchase Program for Tungsten

Company	Short Ton Units WO ₃	Dollars
Union Carbide Corp.*	693,132	\$ 43,667,321
Wah Chang Corp.*	523,459	32,886,392
Tungsten Mining Corp.	437,027	27,531,826
Getchell Mines, Inc.*	258,400	16,133,866
Nevada-Massachusetts Co.	192,781	12,143,018
Mineral Engineering Co.*	184,666	11,452,919
Nevada Scheelite Corp.*	150,466	9,453,907
Bradley Mining Co.	84,579	5,313,838
Surgeon Mining Co.	31,694	1,991,895
Climax Molybdenum Co.	6,951	437,927
Total, all other companies	405,569	25,062,223
Total Program	2,968,724	\$186,075,032

* Sales of Companies marked with (*) include concentrates from Custom Ore purchases. Sales under P.L. 733 for a total of 282,674 units are not included in above breakdown.

20,000 tons per day to 34,000, and (2) the chemical refinery scheduled for completion in June, 1958 by the Korean Tungsten Mining Company, for treatment of its low-grade concentrate from the Sang Dong mine.

A report on the tungsten supply situation was issued by the Attorney General's office on November 8th, 1957. This included a comprehensive review of the various stockpiling programs that have been the dominant factor in tungsten mining since the Korean War emergency. The critical shortage of tungsten in 1951 created by the Korea war gave rise to three different government stockpile programs:

Program	Authority	Short Ton Units Purchased	Cost
Domestic Tungsten Program	DPA GSA 113 PL 733	2,968,724	\$186,075,032
Foreign purchase program	DPA	2,624,179	159,542,993
National Stockpile ¹	Strategic & Critical Materials Stockpile classified ² Act		

1. Four contracts under this program will terminate in 1958 and one contract on December 4th, 1959. 2. Although actual amounts purchased are classified, testimony given in Congress indicated that an excess of \$250,000,000 will be spent on this program.

URANIUM

"AEC purchases will require an ore delivery rate of 5,500,000 tons in 1958; 7,200,000 in 1959"



W. SPENCER HUTCHINSON, Jr., Assistant to the Manager, Grand Junction Operations Office, U. S. Atomic Energy Commission, Grand Junction, Colorado

In the United States the civilian nuclear power program is directed toward developing power competitive with that produced from low-cost fossil fuels. Until that objective has been achieved and the power industry undertakes large-scale commercial programs, an estimate of the size and timing of the domestic industrial uranium requirements must be based upon the opinions of those conducting the development work. When speaking to the National Western Mining Conference a year ago, Commissioner Libby stated that "Ten to 20 years from now the United States power industry alone may require from 20,000 to 30,000 tons of U₃O₈ per year." It has since been stated that this is still a good estimate.

In Europe the development of nuclear power facilities is expected to proceed more rapidly. There, reactors that can be built today are expected to produce power that will be approximately competitive with power produced from coal and oil. Europe is now planning large industrial atomic programs. The British are engaged in \$2,000,000,000 to \$3,000,000,000 10-year program, designed to reach a capacity of 5,000,000 to 6,000,000 kilowatts of electricity by 1965 or 1966. In a recent article by Sir Edwin Plowden, Chairman of the United Kingdom Atomic Energy Authority, this information was released on the requirements of the British program:

"This expanding programme will require an increasing annual tonnage of uranium. Between 1,000 and 2,000 tons a year of uranium oxide will be required from the time the first stations have to be fueled, that is to say, from 1961 onwards. The demand will increase steadily until well into the 1970's, when it will probably lie between 5,000 and 10,000 tons a year. It is difficult to estimate later requirements accurately, as they will depend on the rate of increase in the demand for electricity, and on the types of

reactor built to satisfy this; but by the mid-seventies uranium will be needed not only for the large initial charges for new reactors but also for the smaller replacement charges for those reactors already working."

The Euratom countries are considering a \$6,000,000,000 10-year program to provide 15,000,000 kilowatts of electrical capacity by 1967. It has been stated that estimates for such a program might require 35,000 to 70,000 tons of U₃O₈ or 5,000 to 10,000 tons a year if delivered in a seven-year period. Also, that if the requirements during the succeeding 10 years follow the British pattern as indicated by Sir Edwin Plowden, annual requirements of the Euratom countries might reach 30,000 tons a year or more.

Jesse C. Johnson of the AEC announced in New York, New York in October 1957, that uranium deliveries under the Commission's present domestic and foreign procurement commitments appeared adequate for military and power requirements as projected for the next few years. Also, that under these circumstances the Commission, at that time, was faced with limiting commitments for additional domestic uranium.

However, the increasing United States government market for domestic uranium was indicated in a recent announcement made by Mr. Johnson. Domestic uranium concentrate purchases by the AEC were approximately \$134,000,000 in 1956 and \$171,000,000 in 1957. Purchases for 1958 were estimated at \$247,000,000 and for 1959, at \$322,000,000 or almost double that of 1957. These purchases, stated in terms of ore production, will require a mine ore delivery rate of 5,500,000 tons in 1958 and about 7,200,000 tons in 1959 as compared to the United States production in 1957 of 3,676,000 tons.

The year 1957 marked the continued major increase in uranium production throughout the Free World and especially in Canada and the United States. Total Free World production in 1957 amounted to about 21,000 tons of U₃O₈, and the estimate for 1959 is in excess of 40,000 tons, with more than 30,000 tons coming from the United States and Canada. Major increases in uranium production will occur in the next 12 to 14 months with the completion and operation of a number of large Canadian and American uranium mining and milling projects.

Uranium concentrates produced in the United States in 1957 totaled 8,640 tons of U_3O_8 , Canada about 4,000 tons, and South Africa about 6,000 tons, with the balance being principally produced by the Belgian Congo, France, Australia, and Portugal.

United States Developments:

Uranium Production

	1957	1956	1955*
Concentrates (tons U_3O_8)	8,640	6,000	1,600
Tons of ore	3,676,000	3,000,000	840,000
December milling rate, operating mills (tons per day)	11,085	8,960	4,500
Capacity, plants under construction (tons per day)	9,935	4,575	2,450

* 6 months, July-December 1955

In December 1957, United States mills were producing concentrates at a rate of about 800 tons of U_3O_8 per month and treating an average of about 10,150 tons of ore per day having an average grade of 0.27 percent U_3O_8 . Four new mills commenced operations during the year and nine mills under construction at year's end will commence operations in 1958 or early 1959. Two of the older mills operating in December 1957 are scheduled to close down early in 1958, one being replaced by a new and larger plant and the other operation being consolidated with an existing plant.

Domestic ore reserves (measured, indicated and inferred ore) are now estimated at 78,000,000 tons or an increase during the year of some 18,000,000 tons. The major part of the increase resulted from extensive exploration in two districts, one in New Mexico and the other in Wyoming. The distribution by states in the United States is as follows:

Area	December 31, 1957		November 1, 1956	
	Tons	Per-cent U_3O_8	Tons	Per-cent U_3O_8
New Mexico	53,300,000	0.26	41,000,000	0.24
Wyoming	9,200,000	0.26	2,300,000	0.22
Utah	5,700,000	0.37	7,500,000	0.34
Colorado	4,100,000	0.29	4,100,000	0.33
Arizona	1,400,000	0.32	2,600,000	0.30
Washington, Oregon, & Nevada	1,900,000	0.23	—	—
North and South Dakota	600,000	0.25	2,500,000	0.20
Others (Texas, California, Montana, Idaho, & Alaska)	1,800,000	0.23	—	—
Totals	78,000,000	0.27	60,000,000	0.25



BLAIR BURWELL
President, Minerals Engineering Company, Grand Junction, Colorado

Vanadium production in the United States is estimated to be 12,540,000 pounds of V_2O_5 in fused oxide for 1957 compared with 14,060,000 pounds in 1956. American consumption is estimated at 3,590,000 pounds of vanadium or 7,180,000 pounds of oxide equivalent compared with 3,976,000 pounds of vanadium in 1956. Exports were approximately 2,660,000 pounds of fused oxide or alloy equivalent. With industry stocks about the same in the year ending of 1957 as in 1956, a discrepancy of 3,000,000 pounds of V_2O_5 in fused oxide is to be noted in government figures. This is partially represented by stocks in the hands of mills with Atomic Energy Commission contracts who withheld delivery by government request, and part by consumption for uses not reported by industry.

Seventy-five per cent visible consumption of vanadium continues in ferrous uses, such as engineering steel, cast iron, tool steel, and high speed steel, and in these uses, most of the reduction of consumption occurred in 1957. Increased interest and consumption of the metal in aluminum-vanadium alloy for high-strength titanium and as pure ductile metal was noted in 1957. Ductile vanadium for cladding in atomic energy power stations has generated interest here and in Europe. Research on uses, as a catalyst in automobile engine exhausts for reducing smog and carbon monoxide, has generated interest.

Interest in production of pure vanadium oxide low in soda adapted to direct steel additions developed in 1957. Conven-

Markets: The principal market for Free World production of uranium has been purchases made by the United States government through contracts with domestic producers and foreign governments. In November 1957, the AEC Commission released an unclassified financial report for the fiscal year 1957 (July 1, 1956 thru June 30, 1957), which contained heretofore unpublished information on uranium concentrate procurement. In fiscal year 1957, a total of 32,355,000 pounds of uranium were purchased, of which 15,204,000 pounds came from the United States, and 17,151,000 pounds from foreign countries. Total expenditures for this material were \$355,865,000, of which \$164,182,000 was for the domestic product, and \$191,683,000 was for material from other countries. The average cost per pound of uranium concentrate from domestic sources in fiscal year 1957 was \$10.80 per pound of U_3O_8 , which was 10 percent lower than in fiscal year 1956. The average from other countries was \$11.18 per pound of U_3O_8 , and the average from all sources was \$11.00 per pound of U_3O_8 . These figures include certain costs in addition to the price paid producers.

The trend in average prices paid for uranium concentrates is shown by a recent announcement made by Jesse C. Johnson on prices paid under existing contracts with the AEC which includes all United States purchases of raw materials. The average price paid for domestic concentrate in fiscal year 1956 was \$11.60 per pound of U_3O_8 , and in 1957, \$10.50. The estimate for fiscal year 1958 is \$9.60 and for 1959, \$9.30. These prices include a factor for amortization on a five-year basis and are based upon an estimated normal grade of mill feed. Domestic production prices vary and may be somewhat higher or lower, depending on variances in mill feed grade. The average price paid in United States dollars for foreign concentrate was \$10.90 per pound of U_3O_8 in fiscal year 1956 and \$11.15 in 1957. The estimate for 1958 is \$11.15 and for 1959, \$10.70. All contract prices, domestic and foreign, have been negotiated on the estimated costs of production or are related to audited costs of production.

These price differences do not indicate the wide differences in the uranium content of the material processed. Recovery from South African gold tailings averages about one-half a pound of U_3O_8 per ton. In Blind River, Canada's major uranium field, recovery will be about two pounds per ton of ore. In the United States, it is about five pounds.

VANADIUM

"A problem of cost survival in older Plateau vanadium producing areas is developing"

tionally, vanadium is used as ferrovanadium which is usually made by aluminum reduction of high soda oxide which adds to the cost of vanadium in steel. One large producer initiated the sale of self-reducing mixtures containing fused oxide and ferro-silicon in 1957 which could be substituted for ferrovanadium in certain uses. The low soda avoids former difficulty with furnace linings. The trend may increase in 1958 as it decreases final user costs and holds prices of fused oxide at the expense of the intermediate ferro alloy industry.

The United States continued to be the largest producer in the world, exporting a substantial portion of its output. Outside of the United States the production of vanadium from iron ores increased in northern Europe and is reported to have occurred in Russia. An initial output of fused oxide from iron ores of the Transvaal, Union of South Africa, occurred at the year end. Lead vanadate mines in South West Africa further curtailed in 1957 and suspended production at the year end.

The outlook for vanadium markets and consumption for the future looks attractive because of new uses and applications indicated by research which have been stimulated to a certain extent by the assurance of abundant supply from uranium-vanadium ores of the Colorado Plateau. However, it must be noted that new and extensive discoveries of Colorado Plateau ore in 1957 were of the type low in vanadium and new mills and mines do not contemplate vanadium recovery due to low content. The original uranium-vanadium recovery plants of the higher vanadium ores are relatively high cost due to duplex processing and old mills, and are dependent on depleted ore reserves of deeper burial and high mining cost. As older high-priced uranium contracts expire on original mills and are replaced by lower competitive prices by the AEC, a problem of cost survival in older Plateau vanadium producing areas is developing and probably will reduce output substantially in 1958.

A LOOK AT

U. S. Mining in 1957

Alaska

● Exploration for Iron and Copper Is at High Level; Hg Output Is Still Growing

Alaska's mineral production for 1957 is estimated at nearly \$26,000,000, an increase of 11 percent over that of 1956. Gold, coal, and sand and gravel are the three commodities at the top of the list in value. Gold apparently leads coal by a very slight margin, but might be surpassed when the final returns are in. Mercury is in apparent fourth place, but platinum and uranium were in large-scale production and may have been as high in value. The production figures for these last two commodities cannot be revealed.

Lode gold mining is practically nonexistent in Alaska, and placer operators continue to be forced out of operation by increasing costs. The major portion of the gold production was by United States Smelting, Refining and Mining Company from its Fairbanks and Nome dredging operations. Goodnews Bay Mining Company operated as usual in the Bristol Bay area and continues to be the major United States platinum producer. DeCoursey Mountain Mining Company surpassed their last year's record for mercury production. Kenai Chrome Company continued to mine chromite but was closed down earlier than usual by weather conditions. The most important development of the year was the first uranium mine in Alaska operated by a subsidiary of Climax Molybdenum Company.

SOUTHEASTERN-Climax Molybdenum Company started an open pit uranium mine on Prince of Wales Island, shipping by barge and rail to Dawn Mining Company's mill near Spokane, Washington. Columbia Iron Mining Company (United States Steel subsidiary) continued investigations and drilling of iron possibilities throughout Southeastern Alaska, and concentrated another large quantity of material at the Klukwan deposit for testing. Utah Company of the Americas of Vancouver is



Please Turn To

Page 224 for charts showing U. S. mine production of key metals from 1900 to 1958.

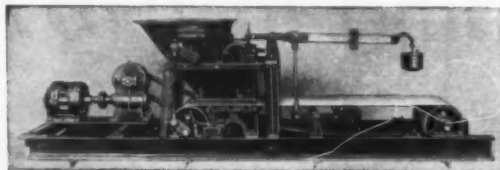
Page 221 to check Minnesota, Michigan, and Wisconsin mine shipments of iron ore.

Page 222 for listing of tonnages mined at important U. S. open pit mines.

Page 223 to see the rank of the major underground U. S. mines.

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14"	4' 6" & 6' 0"		10 Tons	Finely ground	No
	2' 6"	8 Tons		1/2" Cubes	No
	4' 6" & 6' 0"		20 Tons	1/2" Cubes	No
20"	2' 6"	15 Tons		1 1/2" Cubes	No
	4' 6" & 6' 0"		45 Tons	1 1/2" Cubes	Yes
30"	4' 6" & 6' 0"		125 Tons	3" Cubes	Yes
36"	4' 6" & 6' 0"		160 Tons	4" Cubes	Yes
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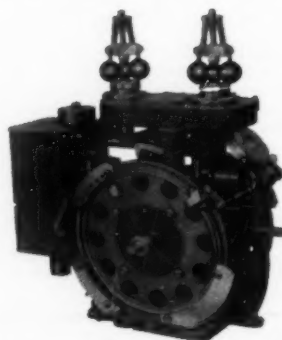
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Mineral Production of Alaska from 1955 through 1957

Mineral	1955		1956		1957 ¹	
	Quantity	Value	Quantity	Value	Quantity	Value
Chromite ¹	7,082	\$ 625,340	7,193	\$ 711,481	4,200	\$ 427,000
Coal, bituminous ¹	639,696	5,759,000	726,801	6,373,976	825,000	7,425,000
Gold ²	249,294	8,725,000	209,296	7,325,360	215,000	7,525,000
Lead ³	—	—	1	314	1	268
Mercury ⁴	(5)	(5)	3,280	852,539	5,300	1,309,100
Sand and gravel ⁵	9,793,214	8,242,344	5,955,105	5,879,799	5,800,000	5,900,000
Silver ⁶	33,693	30,394	28,360	25,667	26,000	23,500
Stones ¹	265,740	289,589	194,864	594,894	120,000	370,000
Tin ⁴	86	182,484	—	—	—	—
Undistributed ⁶	—	1,557,307	—	1,643,937	—	3,010,250
TOTAL		\$25,412,000		\$23,408,000		\$25,996,000

¹ Estimated. 1. Short tons. 2. Fine ounces. 3. Flasks. 4. Long tons. 5. Value included with undistributed gem stones and other minerals whose value must be concealed to avoid disclosing company incomes. 6. Includes platinum.

drilling two iron deposits on Prince of Wales Island. Admiralty Alaska Gold Mining Company is continuing its exploration program on its nickel lode at Funder Bay. A uranium prospect near William Henry Bay was drilled.

SOUTH CENTRAL—Kenai Chrome Company continued mining and shipping metallurgical grade chromite from the Star 4 property on Red Mountain, and also stockpiled lower grade ore for treatment at its new mill during the winter. Investigation of the Red Top mercury deposit near Dillingham was continued. Northern Pyrites continued drilling a pyrite deposit on Latouche Island for the third consecutive season.

YUKON BASIN—Earle Pilgrim made a shipment of highgrade antimony ore from the Stampede Mine in the Kautishna. DeCoursey Mountain Mining Company increased mercury production to a new high and is on a year-around basis. Other mercury deposits in the region are being investigated. United States Smelting, Refining and Mining Company put in a full season of dredging in the Hogatz River area. Other large dredging concerns operated about as usual.

NORTHWESTERN—Rhinehart Berg's Ruby Creek copper prospect near Shungnak was under option and being drilled by Bear Creek Mining Company.

Arizona

● Metal Output Is Up But Value Goes Down; Ray Mines and Duvall Projects Progress

The total value of Arizona's mineral production in 1957 (exclusive of uranium) is estimated at \$360,626,000 compared to \$479,551,000 in 1956. The decline resulted from the lower value of the state's copper output as the average price per pound declined from 42.5 cents in 1956 to 30 cents in 1957.

Arizona's 1957 copper output totaled 512,600 tons valued at \$307,560,000, compared to 505,908 tons valued at \$430,021,800 in 1956. While the actual tonnage produced in 1957 was greater than in 1956, the lower price received meant a drop of \$122,461,800 in value.

San Manuel Copper Corporation reached its scheduled rate of production in June, and became the state's fourth-ranking producer, replacing Kennecott Copper Corporation's Ray Division which now holds fifth place. The three largest producers again were the Morenci, Copper Queen and New Cornelia operations of Phelps Dodge Corporation.

Pima Mining Company became Arizona's newest open-pit copper mine in January 1957 when the 3,300-ton-per-day flotation plant was placed in operation.

American Smelting and Refining Company announced a major copper discovery in the East Pima District. Indicated reserves were said to be about twice the size of the company's Silver Bell copper mine in Arizona. The East Pima area is adjacent to the 15,000 acres of Papago Indian Reservation land for which Asarco in May bid \$1,066,007 for the exploration rights.

A second development is the preparation of the Esperanza mine for production by Duval Sulphur and Potash Company. Some 5,000,000 tons of overburden are being stripped from a low-grade copper deposit with important molybdenum content. A 10,000-ton-per-day flotation plant is being erected and the target date for production is set for early 1959.

Inspiration Consolidated Copper Company made history with the conversion of copper recovery facilities to the Dual-Process. The ore is acid-leached to recover the copper oxide, and the residue goes to Inspiration's rebuilt, 15,000-ton flotation mill for recovery of the copper sulphide fraction. The concentrator was started in January 1957. Progress was made by Ray Mines Division of Kennecott Copper Corporation on a \$40,000,000 program of mine and mill expansion and smelter construction. The L.P.F. plant at Ray Mines moved to completion during the year.

Copper concerns embarked on curtailment and cost-reduction programs. With a few exceptions, the work-week for hourly employees of the major producers was reduced from 48 hours to 40 hours to cut the number of hours at premium pay. In addition, the following production cuts had been announced before the year's end: Phelps Dodge, 22 percent; Miami, 23 percent; Inspiration, 17 percent; Kennecott's Ray Mines, 15 percent; and Banner, 65 percent.

The Iron King mine, operated by Shattuck Denn Mining Corporation and the state's leading lead-zinc producer was active throughout the year.

Several other lead-zinc producers were forced to close near mid-year.

Arizona Production of Molybdenum, Gold, Silver, Copper, Lead, and Zinc. Dollar Value of Base Metals From 1941 through 1957

Year	Molybdenum Pounds	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	NA	315,392	7,498,260	326,317	15,638	16,493	\$ 97,638,310
1942	NA	253,651	7,064,467	393,387	14,772	18,522	114,525,600
1943	NA	171,810	5,713,889	403,181	13,727	19,677	121,212,902
1944	NA	112,162	4,394,039	358,303	16,707	29,077	113,094,806
1945	NA	77,223	3,558,216	287,203	22,867	40,226	95,963,006
1946	NA	79,024	3,268,765	289,223	23,930	43,665	114,986,254
1947	NA	95,860	4,569,084	366,218	28,566	54,644	182,752,537
1948	NA	109,487	4,837,740	375,121	29,899	54,478	196,207,948
1949	NA	108,993	4,970,736	359,021	33,568	70,658	177,894,134
1950	NA	118,313	5,325,441	403,301	26,383	60,480	201,033,694
1951	1,172,740	116,093	5,120,985	415,870	17,394	52,999	235,289,045
1952	2,022,832	112,355	4,701,330	395,719	16,520	47,143	220,686,278
1953	1,446,557	112,824	4,351,429	393,525	7,092	19,613	242,572,489
1954	1,538,088	14,809	4,298,811	377,927	8,885	21,461	237,818,952
1955	1,497,000	127,616	4,634,179	454,105	9,217	22,684	325,928,786
1956	2,392,000	146,110	5,179,185	505,908	11,999	25,580	453,270,137
1957 ¹	2,370,000	157,300	5,336,000	512,600	12,500	33,300	331,882,350

1. Estimated by U. S. Bureau of Mines. NA—Not available.

These included McFarland and Hurlinger at the San Xavier mine; the Coronado Copper & Zinc Company, Johnson Camp, copper-zinc operation; and Asarco's Trench unit.

Uranium activities in the Globe area received a near-fatal blow when the AEC closed its buying station at Cutter on June 30 because of limited ore receipts and difficult metallurgy. However, production from the Four Corners area continued, and the 250-ton uranium processing mill at Tuba City was operated throughout the year by Rare Metals Corporation of America. In 1957, negotiations were started for authorization to increase the plant's capacity to 400 tons daily.

California

● New Borax Facilities Are Completed; Iron Ore Output Holds Steady at 1956 Pace

Mining output was down in California during 1957. The value of metal recovered from ore declined 23 percent under 1956 figures. Income from non-metallic minerals during 1957 was somewhat lower than in 1956.

Iron ore production at Kaiser Steel Corporation's Eagle Mountain mine was a bit higher in 1957. Kaiser carried on a \$194,000,000 expansion program which was expected to nearly double the capacity of the Fontana steel mill. A second ore beneficiation plant was completed and placed in operation at Eagle Mountain mine. Several mines in San Bernardino County shipped modest tonnages of iron ore.

In mid-1957 a milestone was reached when United States Borax & Chemical Corporation started mining borax ore from a newly developed open pit. The open pit was part of a \$20,000,000 project to centralize mining and treatment facilities at Boron, California. The project included a 10,000,000 ton stripping program and construction of a new \$18,000,000 refinery.

Pyrite production was higher in 1957 due largely to steady production from a new open pit at the Iron Mountain property of Mountain Copper Company. The open pit was brought into full production in the latter part of 1956 and replaced underground induced caving methods of ore extraction.

Gold output dropped to a 12 year low due to cessation of underground lode mining activities in Nevada County. High grade lode gold mines in El Dorado, Sierra and Siskiyou Counties continued to operate. More than 70 percent

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California Production of Metals and Minerals, Dollar Value is Given For Base and Precious Metal Output From 1941 Through 1957

Year	Iron Ore Long Tons	Chromite Tons	Mercury Flasks	Tungsten Tons (60% WO ₃)	Boron Minerals Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	60,293	13,419	25,714	2,603	301,282	1,408,793	2,154,188	3,943	3,464	440	\$52,231,066
1942	95,107	44,873	29,906	3,483	226,723	847,997	1,450,440	1,058	5,151	613	31,771,607
1943	794,440	62,495	33,812	3,871	256,633	148,328	609,075	8,762	5,820	1,856	9,176,616
1944	845,260	34,715	28,052	3,027	277,586	117,373	778,936	12,721	5,682	8,455	10,933,495
1945	280,573	9,607	21,199	1,073	325,935	147,938	986,798	6,473	7,224	9,923	11,152,081
1946	340,491	4,107 ¹	17,782	1,262	430,689	356,824	1,342,651	4,240	9,923	6,877	18,788,664
1947	530,434	948	17,165	394	501,935	431,415	1,597,442	2,407	10,080	5,415	21,769,620
1948	153,684	274	11,188	1,767	450,932	421,473	724,771	481	9,110	5,325	20,294,093
1949	536,525	433	4,493	952	467,592	417,231	783,880	649	10,318	7,209	20,616,562
1950	831,445	404	3,850	2,025	647,735	412,118	1,071,917	696	15,831	7,551	22,081,859
1951	1,198,847	6,302	4,282	3,007	862,797	339,732	1,145,219	921	13,967	9,602	21,700,575
1952	1,516,373	14,713	7,241	2,980	585,828	258,176	1,099,658	800	11,199	9,419	17,151,792
1953	1,697,652	26,512	9,290	2,130	715,228	234,591	1,036,072	382	8,664	5,358	12,870,230
1954	1,270,292	30,661	11,262	3,089	790,449	237,886	309,575	362	2,671	1,415	9,857,265
1955	1,776,536	22,105	9,875	4,383	924,496	251,737	954,181	613	8,265	6,836	14,276,301
1956	2,414,277	27,082	9,017	3,719	315,047*	193,816	938,139	859	9,296	8,049	13,487,143
1957 ¹	2,470,000	32,000	14,250	2,700	308,000*	166,700	515,000	830	3,640	2,980	8,532,300

1. Estimated by U. S. Bureau of Mines; * Reported as B₂O₃ content of ore.

of California gold was recovered from placer operations.

Mercury registered a substantial gain in 1957 due partly to a plant clean-up by New Idria Mining & Chemical Company. New Idria has discovered additional ore along the west side of a thrust fault zone, an area previously considered barren, and nearly all recent production has been mined in this area. Other producers contributing to the increase were California Quicksilver Mines, Inc. and Palo Alto Mining Company. In a major transaction, the Altona Quicksilver lease in Trinity County was sold to Rare Metals Corporation of America.

Little copper production was recorded other than by-product copper recovered from processing of lead, zinc or tungsten. Exploration activity was high, however, in the Shasta District northwest of Redding. Both Phelps Dodge Corporation and Miami Copper Company were reported to be carrying on search programs.

Central

● Iron Ore Exploration Is Booming; Lead Belt Output Slightly Above 1956 Total

Mines in the Lead Belt of southeastern Missouri produced 37 percent of the total domestic mine output of lead in 1957. Output was maintained slightly above the 1956 rate. St. Joseph Lead Company was again the largest tonnage ore producer in the nation with 5 mining operations in the Lead Belt producing steadily during the year. All of these mines are equipped with mills and the combined capacity of daily feed is about 28,000 tons of ore.

Kansas Production of Lead, and Zinc from 1941 Through 1957

Year	Lead Tons	Zinc Tons
1941	14,538	71,403
1942	9,419	55,874
1943	9,213	56,944
1944	9,394	63,703
1945	7,370	48,394
1946	6,445	47,703
1947	7,285	41,497
1948	8,386	35,577
1949	9,772	29,433
1950	9,487	27,176
1951	8,947	28,904
1952	9,316	25,482
1953	3,347	15,515
1954	4,033	19,110
1955	5,498	27,611
1956	7,635	28,665
1957 ¹	4,300	15,800

1. Estimated by U.S. Bureau of Mines.

In Madison County the Mine La Motte Corporation and the National Lead Company each operated a mine group and mill. Mine La Motte, jointly owned by St. Joseph Lead Company and National Lead, engaged in shaft sinking to open up a lead ore body on a property located 30 miles south of the Lead Belt. This district is said to offer good potential and as many as four shafts may be required for mining.

Commercial quantities of copper, cobalt and nickel are recovered from the ore mined by National Lead. The company's cobalt refinery at Fredricktown reportedly operated at greater capacity in 1957.

Ozark Ore Company closed down its underground mining operations at Iron Mountain, Missouri, for a short period while five conveyor belts and the primary crusher were moved to a lower level.

In the northern Illinois-Wisconsin lead-zinc region, lead output declined 11 percent. Tri-State Zinc, Inc., one of the three leading producers in the district, maintained production rates at a fairly high level. Output from properties of American Zinc Lead & Smelting Company and Eagle Picher Company was greatly curtailed.

Zinc recovered in Illinois was down 8 percent in 1957. The decrease resulted largely from curtailment of output from the fluorspar-lead-zinc mines in southern Illinois. Zinc production in northern Illinois-Wisconsin district was slightly greater in 1957.

The Illinois-Kentucky area contributed nearly 200,000 tons or 65 percent of the estimated total domestic output of fluorspar in 1957. Illinois' share of production amounted to about 180,000 tons. An independent producer, H. Evans Roberts, acquired the Humm Mackey-Hicks Creek properties. Major fluorspar opera-

tors and consumers were actively running surveys and geologic investigations in the area during 1957.

Missouri's Howell County iron ore industry went far ahead of the \$1,000,000 mark last year according to reports. Some 60 mine operators were active and approximately 2,805 carloads of ore was shipped in 1957 from the West Plains and Brandsville area.

Colorado

● Large Mines Produce More Metal as Mo, Cu, Pb, Zn Output Higher Than 1956

With Colorado's large mines operating at record and near record capacity during 1957 production of molybdenum, copper, lead, zinc, pyrite, and acid grade fluorspar increased over 1956. However, the number of producing units dropped radically because of the price drops in copper, lead, and zinc.

The Climax Molybdenum Company Division of American Metal Climax, Inc. set an all-time yearly high of about 10,800,000 tons of ore mined and milled. First six months production was 5,327,000 tons assaying 0.352 percent MoS₂. This is also the greatest tonnage ever mined from one underground mine in the United States in a single year. Molybdenum output was increased to about 43,000,000 pounds from 37,489,000 in 1956. Climax was also the state's largest tungsten and tin (byproduct) producer but no concentrates of these two metals were sold during the year. Byproduct pyrite

Colorado Production of Molybdenum, Tungsten, Gold, Silver, Copper, Lead, and Zinc. Dollar Value of Base Metals From 1941 Through 1957

Year	Molybde- num Pounds	Tungsten 60%WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	27,751,273	646	380,029	7,301,697	6,748	12,574	15,722	\$23,877,597
1942	41,852,136	380	268,627	5,096,211	1,102	15,181	32,215	19,896,623
1943	46,133,715	378	137,558	2,664,142	1,028	18,032	44,094	19,205,415
1944	23,608,421	296	111,455	2,248,830	1,048	17,698	39,995	17,724,473
1945	18,525,041	234	100,935	2,226,780	1,485	17,044	35,773	16,676,521
1946	10,816,426	213	142,613	2,240,151	1,754	17,036	36,147	19,903,509
1947	11,512,719	68	168,279	2,557,653	2,150	18,696	38,745	23,868,179
1948	13,172,094	208	154,802	3,011,011	2,298	25,143	45,164	30,155,337
1949	10,752,817	222	102,618	2,894,886	2,403	26,853	47,703	27,474,322
1950	11,903,043	196	130,390	3,492,278	3,141	27,007	45,776	29,323,268
1951	22,538,739	336	116,503	2,787,882	3,212	30,336	55,714	38,931,539
1952	23,874,408	625	124,594	2,813,643	3,606	30,066	53,203	35,997,231
1953	37,306,341	864	119,218	2,200,000	2,941	21,754	37,809	22,247,780
1954	42,544,795	927	96,146	3,417,072	4,523	17,823	35,150	21,602,205
1955	43,043,000	1,152	88,577	2,772,073	4,323	15,805	35,350	22,240,009
1956	37,489,000	873	97,668	2,284,701	4,228	19,858	40,246	26,342,138
1957 ¹	43,000,000	13	88,200	2,834,000	5,200	21,000	46,200	25,445,900
	Vanadium	5	582,484	pounds				
1957 ¹	Vanadium	5	254,500	Uranium oxide	3,386,773	Pounds		

1. Preliminary, U. S. Bureau Mines.



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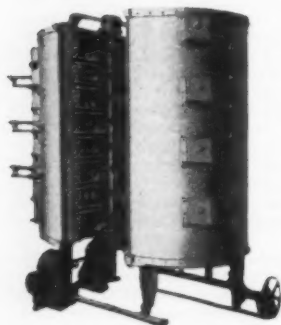
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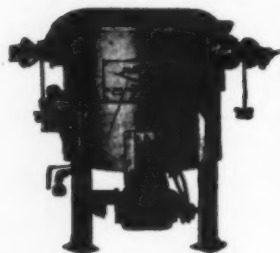
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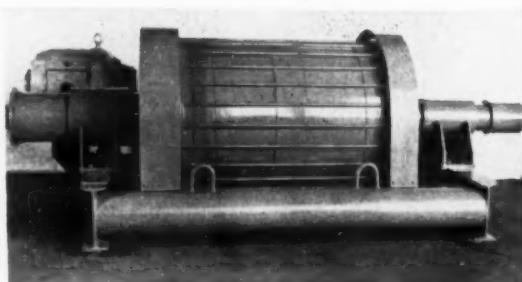
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was also produced and sold to a sulphuric acid plant. Byproduct production from Climax will increase in 1958 as the new plant under construction during 1957 will be on stream early in 1958 to treat the 34,000 daily tons of molybdenum tailing; the old plant's capacity being only 20,000 daily tons. Climax celebrated the mining of the first 100,000,000 tons of ore on February 4. Work started late in the year to sink an 18-foot diameter circular shaft to the 1,000 foot level for deep exploration and development.

Expanded output of base metals was largely the result of higher tonnage mined at the remodeled 1,400 ton per day Telluride mill of Idarado Mining Company, and the regular operations of the Empire Zinc Division, New Jersey Zinc Company at Gilman. Idarado mined and milled 455,000 tons of gold-silver-lead-zinc-copper ore from the Black Bear and Argentine vein systems, increased development footage, and initiated a large diamond drill program. Empire Zinc continued deep development and stope preparation, made a series of underground geophysical surveys, and continued regular production of 4,400 tons of zinc concentrate, 700 tons of lead concentrate and 1,800 tons of copper-silver ore per month.

Five uranium mills produced 18 percent of United States uranium concentrate. Mills operated were: Climax Uranium Company; Naturita and Durango mills of Vanadium Corporation of America; and Uravan and Rifle mills of Union Carbide Nuclear Corporation. At year's end Carbide Nuclear had virtually finished its new Trace Elements mill at Maybell, its uranium upgrader at Slick Rock, and a new mill at Rifle. Gunnison Mining Company's new mill construction at Gunnison was about finished during the year.

Colorado continued to be an important fluorspar producer with Ozark-Mahoning Company operating its 120 ton per day acid grade flotation mill at Northgate, and open pit and underground mines throughout the year. General Chemical Company also produced concentrate from its Boulder County operations.

Eastern

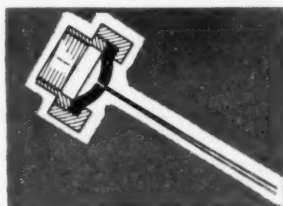
• Kennecott To Build New Copper Refinery; New York Is Number One Zinc Producer

New York was again the largest zinc-producing state in the nation in 1957. A 10 percent increase in zinc output from St. Joseph Lead Company's Balmat and

Production of Metals and Minerals in New Jersey, New York, Pennsylvania,* and Virginia in 1956 and 1957¹

	1956	1957 ¹
New Jersey		
Zinc ²	4,667	12,400
Iron ³	911,535	919,000
New York		
Silver ⁴	84,158	83,800
Lead ²	1,608	1,200
Zinc ²	59,111	64,900
Pennsylvania		
Cobalt ²	533,329	622,000
Virginia		
Manganese ²	20,231	15,500
Zinc ²	19,196	18,900
Lead ²	3,035	3,250

1. Estimated by U.S. Bureau of Mines. 2. Short tons. 3. Long Tons. 4. Fine Ounces. 5. Pounds. * Copper and iron tonnages not reported by U.S. Bureau of Mines.



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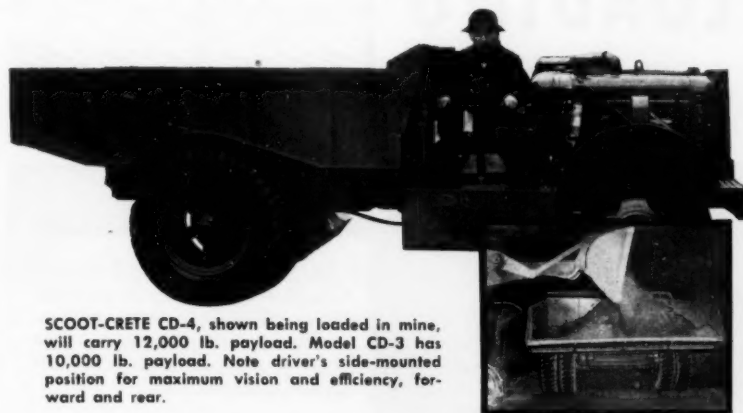
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Percent Solids	Sp. Gr. Pulp	TONS SOLIDS PER 24 HOURS				
		GALLONS PER MINUTE				
		20	30	40	50	60
10	1.07	13	19	26	32	48
20	1.14	27	41	55	68	82
30	1.23	44	67	89	111	133
40	1.34	64	97	120	161	193
50	1.46	87	130	174	217	261

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Edwards mines in St. Lawrence County raised the state's estimated 1957 total to 64,900 tons. The Balmat continued to be the largest zinc mine in the United States. In New Jersey, zinc production showed a marked increase. New Jersey Zinc Company operated the Sterling mine from January to mid-August, then shut-down pending market improvement. Even so, zinc output was higher in 1957 because the Sterling mine was closed the first 8 months of 1956 by a strike.

Recovery of zinc from Virginia ores in 1957 was just slightly less than in 1956. New Jersey Zinc Company operated the Austinville mine continuously except for a 3-week shutdown due to a strike. The 13,000-foot tunnel between the Austinville and Ivanhoe mines was completed during the year. The tunnel provides a haulageway and a means for quick transportation of supplies between the two mines. At Timberville, Virginia the newly developed zinc mine and 700-ton mill of Tri-State Zinc, Inc., reached the productive stage in the summer of 1957. St. Joseph Lead Company closed its plant at Moundsville, West Virginia which recovers zinc from residues. The prevailing low price of zinc was the reason cited for suspension of activities.

In Pennsylvania, Bethlehem Cornwall Corporation continued an extensive development program at the Grace mine. Full-scale operation of the Grace mine is slated this year. Important quantities of by-product cobalt concentrate is produced from ore mined by Bethlehem Cornwall. Cobalt output increased 17 percent during 1957. Iron ore output was slightly higher in 1957.

Interest in ilmenite exploration ran high in New Jersey during 1957, following a late 1956 announcement by state geologists of the occurrence of commercial quantities and grades of this mineral. American Smelting & Refining Company was among those actively investigating titanium-bearing sand deposits. Asarco leased thousands of acres of land in an area located between Lakehurst, New Jersey and the Atlantic Ocean.

Metal & Thermit Company started production of rutile and ilmenite from a plant at Beaver Dam, Virginia. The ore containing about 2.5 percent heavy minerals, split about 50-50 rutile and ilmenite, is strip mined with tractor-drawn scrapers. It is concentrated by spirals, tables, magnetic separators and high tension separators.

The Tahawus, New York, ore mined by National Lead Company contains approximately 18 percent titanium dioxide and 34 percent iron according to a U. S. Bureau of Mines survey. The survey set National Lead's Essex County reserves of titanium-bearing ore at about 121,500,000 tons.

Idaho

● Lead and Zinc Output Show Substantial Gain; Open Pit Developed at Cobalt Mine

Production gains were scored by all of Idaho's principal minerals in 1957 with the exception of phosphate rock, tungsten, mercury and titanium. Value of the output, however, fell off 2 percent from 1956, principally because of lower prices for zinc, lead and copper.

Lead again was the state's leading metal in point of value of production. Output was up 9 percent to 70,225 tons

—highest since 1953—for a valuation of more than \$20,200,000. Largest production increases were made by two Shoshone County firms—the Bunker Hill Company and American Smelting and Refining Company.

Zinc output increased 18 percent to 58,600 tons, worth nearly \$13,500,000, with Bunker Hill and ASARCO the major producers. Bunker Hill upped production capacity of its electrolytic zinc plant 25 percent by placing a fifth unit into operation.

A new open pit mine was developed to augment underground production at Calera Mining Company's Blackbird unit at Cobalt, Idaho. The stripping, done under contract by Isbell Construction Company, was underway in June 1957. Stripping ratio at the open pit is 11 to 1. The ore to be mined by open pitting was discovered following a great deal of geological and geophysical work. It is

thought to represent a faulted and offset extension of a mineralized structure which has hosted other ore bodies at Calera.

The nation's leading silver producing state increased output 12 percent to approximately 15,100,000 ounces, valued at about \$13,700,000. Sunshine Mining Company was the No. 1 producer again by a substantial margin. Silver replaced zinc as runner-up to lead for value of production.

Cathode antimony metal, totaling 661 tons, was produced by Sunshine Mining Company which obtained a government contract for \$1,000,000 worth in the two-year period ending June 30, 1959. Bradley Mining Company completed dismantling of its big antimony smelter at Stibnite, Valley County, closed in 1952 and reopened late in 1955 to remove arsenic from metal purchased from Sunshine.

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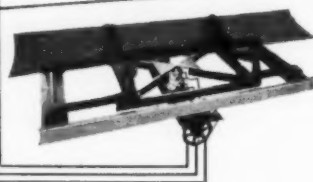
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Idaho Production of Gold, Silver, Copper, Lead, Zinc, Phosphate, Mercury, and Tungsten 1941 to 1957. Dollar Value for Base and Precious Metals

Year	Phosphate Long Tons	Mercury Flasks	Tungsten Conc. 60 percent WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollars Value
1941	97,274	NA	663	149,816	16,672,410	3,621	104,914	79,084	\$41,776,848
1942	115,263 ¹	NA	2,132	95,020	14,644,890	3,430	113,909	87,256	46,063,326
1943	108,916	4,261	4,878	30,808	11,700,180	2,324	96,457	86,707	43,199,910
1944	112,565	1,332	3,957	25,008	9,931,614	1,688	83,530	91,372	42,591,137
1945	123,340	627	2,130	17,780	8,142,667	1,548	68,447	83,465	37,799,975
1946	312,658 ¹	868	641	42,975	6,491,104	1,038	59,987	71,507	37,610,123
1947	845,045	886	61	64,982	10,345,779	1,640	78,944	83,069	55,164,670
1948	434,375	543	86	58,454	11,448,875	1,624	88,544	86,267	67,758,290
1949	471,305	—	66	77,829	10,049,257	1,438	79,299	76,555	56,429,796
1950	573,044	—	222	79,652	16,095,019	2,107	100,025	87,890	70,198,647
1951	695,026	357	377	45,064	14,753,023	2,160	76,713	78,121	70,953,653
1952	620,551	887	333	32,997	14,923,165	3,213	73,719	74,317	64,626,967
1953	1,001,969	NA	441	17,630	13,636,680	2,100	69,885	68,650	47,729,814
1954	1,092,817	—	450	13,245	15,867,414	4,828	69,302	61,528	49,951,702
1955	1,329,959	1,107	642	10,572	13,831,458	5,618	64,163	53,314	49,315,034
1956	1,438,151	3,394	582	9,210	13,471,916	6,656	64,321	49,561	51,949,222
1957 ¹	1,400,000	2,200	38	11,850	15,148,900	7,555	70,225	58,642	52,370,730

1. Estimated by U. S. Bureau of Mines. NA Not available.

Phosphate rock output declined 3 percent to 1,400,000 tons valued at \$6,560,000. Producers were the Anaconda Company and Monsanto Chemical Company in Caribou County; J. R. Simplot Co., Bingham and Clark Counties, and San Francisco Chemical Company, Bear Lake County. Central Farmers Fertilizer Company let contracts for construction of a phosphate processing plant at Georgetown, Bear Lake County.

During the year, Holly Minerals Corporation conducted considerable experimental work on a new method of recovering mercury from ore. The process involves flotation, leaching and electrolytic deposition. Chief advantage is that arsenical or antimonial, mercury ore can be treated. Construction started on a 200-ton-per-day mill at Holly's Hermes mine during the year, and it should be ready early this year.

Substantial increases in Columbite-tantalite output were made by Porter Bros. Corporation in Bear valley dredging operations, Valley County.

Lake Superior District

● Erie Taconite Plant Tuned-Up; Copper Orebody Outlined on Michigan Peninsula

Iron ore production in the Lake Superior District during 1957 exceeded 1956 production by a considerable amount. Total shipments of usable iron ore for 1957 were 84,614,734 long tons compared to 77,633,027 long tons for 1956.

Taconite concentrate output amounted to nearly 6,000,000 gross tons during the year. Reserve Mining Company contributed 5,018,565 tons of this total. Erie Mining Company, Minnesota's second large-scale taconite plant, was put into operation in the latter part of 1957.

Wisconsin Production of Iron Ore, Lead, and Zinc From 1950 Through 1957

Year	Iron Ore Long Tons	Lead Tons	Zinc Tons
1950	—	532	5,722
1951	1,745,120	1,391	15,754
1952	1,485,845	2,000	20,588
1953	1,655,331	2,094	16,830
1954	1,428,910	1,261	15,534
1955	1,886,029	1,948	18,326
1956	1,488,361	2,582	23,890
1957 ¹	1,568,000	2,030	22,130

1. Estimated by U.S. Bureau of Mines.

Though Erie only shipped 112,537 tons from its Taconite Harbor facilities in 1957, rated capacity is 7,500,000 tons of finished pellets per year. Full capacity operation is expected to be attained in the first half of 1958. Another producer of taconite concentrate was Oliver Iron Mining Division of United States Steel Corporation from the Pilotac mine and

Michigan Production of Copper and Iron Ore from 1941 Through 1957.

Year	Copper Tons	Iron Ore Long Tons
1941	46,440	15,201,619
1942	45,679	16,129,474
1943	46,764	14,510,357
1944	42,421	15,425,788
1945	30,401	11,865,624
1946	21,663	8,756,802
1947	24,184	12,965,482
1948	27,777	12,896,478
1949	19,506	11,199,024
1950	25,608	12,691,101
1951	24,979	13,703,901
1952	21,699	11,779,366
1953	24,097	14,326,074
1954	23,593	9,709,167
1955	50,066	14,143,509
1956	61,526	12,536,009
1957 ¹	58,750	12,882,000

1. Estimated by U.S. Bureau of Mines. mill. Pilotac concentrate was sintered and nodulized at Oliver's Exakta plant.

Several new plants and mines were placed into production during 1957. Among these are: Oliver's Stephens Mine at Aurora; Jones and Laughlin Corporation's Arthur re-treat flotation plant at Calumet; and Pickands Mather and Company's Mahoning Plant at Hibbing. In addition Cleveland-Cliffs Iron Company commenced treatment and beneficiation of underground ores at its Ore Improvement plant at Negaunee, Michigan. The Mahoning plant and the Ore Improvement plant utilize the heavy media separation.

Jones and Laughlin's flotation plant introduced a new process on the Mesaba Iron Range. This plant is retreating tailings from the Hill Annex plant of this company. Reclamation from the tailing

pond is done by hydraulic dredge and beneficiation is accomplished by spirals and froth flotation.

Development work including extensive drilling for iron ore near Butternut, Wisconsin was continued by Wisconsin Mining Company and Jones and Laughlin Steel Corporation. Stripping operations were activated at M. A. Hanna's Pierce Group Mines near Hibbing; Jones and Laughlin's Lind Greenway Mine near Grand Rapids, Minnesota; M. A. Hanna's Roberts Mine and Musser Mine on the Cuyuna Range.

M. A. Hanna commenced construction of the Groveland plant near Iron Mountain, Michigan. This plant will beneficiate ores comparable to those being treated at the Humboldt and Republic plants of Cleveland-Cliffs Iron Company. Operation of Groveland is scheduled for the fall of 1958; the plant consists of spirals and flotation for upgrading of specularities.

Highlight of the 1957 season was the celebration commemorating the 50th Anniversary of beneficiation of iron ores in Minnesota. The first treatment plant was the Trout Lake plant of Oliver Iron Mining Company which was placed in operation in 1907. On August 15, 1957, twenty-two plants were opened for public inspection by the various mining companies.

Copper production in Michigan tapered off very suddenly following the collapse of the domestic value during the entire year. White Pine Copper continues to process 12,000 to 16,000 tons-per-day but Calumet and Hecla, and Quincy Mining Company have made cutbacks in production schedules.

United States Metals Refining Company has completed its copper exploration drilling on 20,000 acres near Wakefield, Michigan. On the basis of 132,000 feet of diamond drilling, estimates indicate a deposit of 50,600,000 short tons of copper-bearing shale averaging 1.52

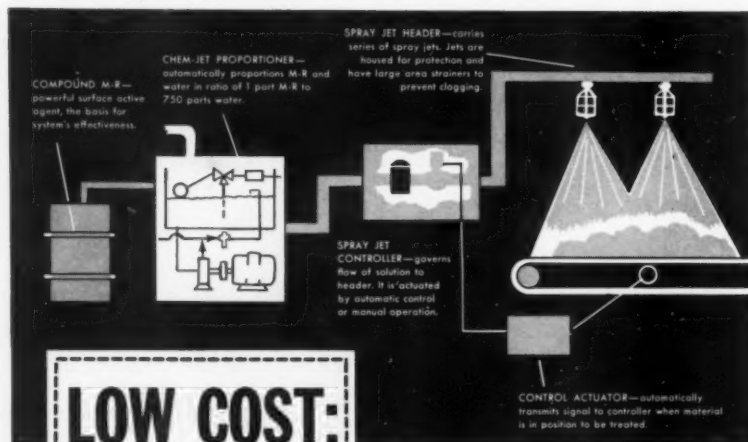
Minnesota Shipments and Average Iron Content of Usable Ore¹ 1946 to 1957

Year	Long Tons	Content %
1946	49,055,340	51.48
1947	62,436,102	50.99
1948	67,923,237	49.86
1949	55,943,714	50.25
1950	64,538,759	49.37
1951	78,164,527	50.33
1952	63,906,069	50.16
1953	80,533,670	50.31
1954	48,613,338	50.94
1955	69,419,334	50.63
1956	62,637,317	51.49
1957 ¹	68,083,000	NA

1. Exclusive of ore containing 5 percent or more manganese. 2. Estimate by U.S. Bureau of Mines. 3. NA—Not available.

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Montana Production of Metals and Minerals From 1941 Through 1957. Dollar Values Shown For Base Metals Only

Year	Tungsten Conc. 60% WO ₃ Tons	Manganese* 35% or More Mn Tons	Chromite* Tons	Fluorspar Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	7	43,555	—	—	246,475	12,386,925	128,036	21,259	60,710	\$ 59,181,627
1942	—	120,409	65,238	—	146,892	11,188,118	141,194	20,050	54,715	60,129,853
1943	1	130,789	75,691	—	59,586	8,450,370	134,525	16,324	37,606	53,642,658
1944	25	153,665	1,251	—	50,021	7,093,215	118,190	13,105	36,127	49,039,855
1945	—	143,888	—	—	44,597	5,942,070	88,506	9,999	17,403	35,405,505
1946	84	129,227	—	—	70,507	3,273,140	58,481	8,280	16,770	29,957,206
1947	4	123,490	—	—	90,124	6,326,190	57,900	16,108	45,679	48,890,964
1948	—	119,339	—	318	73,091	6,930,716	58,252	18,411	59,095	56,422,609
1949	9	107,399	—	422	52,274	6,327,025	56,611	17,996	54,195	49,003,447
1950	—	119,694	—	41	51,764	6,590,747	54,478	19,617	67,678	54,956,689
1951	—	91,080	—	—	30,502	6,393,768	57,406	21,302	75,888	73,149,813
1952	1	90,772	—	16,160	24,161	6,138,185	61,948	21,279	82,185	70,521,092
1953	14	113,429	26,089	5,932	24,768	6,690,000	77,617	19,949	80,271	75,162,000
1954	678	NA	NA	15,102	23,660	5,177,942	59,349	14,820	60,952	57,756,621
1955	1,211	106,026	118,703	25,223	28,123	6,080,390	81,542	17,028	68,588	89,264,689
1956	1,230	80,553	118,780	59,775	38,121	7,385,908	96,426	18,642	70,520	115,157,023
1957 ¹	NA	NA	119,371	NA	27,910	5,114,050	90,896	13,328	49,790	75,433,088

* Gross weight short tons. 1. Estimate by U. S. Bureau Mines.

percent copper and an additional 54,000,000 short-tons of lower-grade shale averaging 1.04 percent copper. This deposit is in the same formation that hosts the ore body of White Pine Copper Company.

Montana

● Berkeley and Kelley Hold Copper Output High; Iron Deposits Look Promising

The total value of minerals, including mineral fuels, produced in Montana during 1957 by U.S. Bureau of Mines estimates was approximately \$184,000,000. This figure is about 14 percent lower than the all time high of \$213,728,000, in 1956. The decrease in value per unit of metal was the main reason for this decrease, however reduced production of metals accomplished by metal-mine closures and production cut backs in Silver Bow County (Butte) was likewise a contributing factor. The value of minerals produced in Silver Bow County in 1957 was \$71,900,000 compared to \$111,100,000 in 1956.

The Anaconda Company closed several of its Butte mines in the middle part of the year. Only the Anselmo (zinc), Emma (manganese), Leonard (copper), and Kelley (copper) underground mines and the Berkeley (copper) open pit mine were in production at year's end. Work on the Northwest project, involving the sinking of two shafts and considerable other underground development work to tap ores at depth was suspended temporarily to await improvement in metal prices. Employees were put on a five-day week basis and the resulting shutdowns and work-week reductions reduced the working force in excess of 2,000 employees. However, with this labor reduction, copper production (tonnage) was only down six percent from the 1956 figure mainly because of ore flowing from the Berkeley pit.

Production from the Kelley mine was maintained at a rate of approximately 15,000 tons of ore per day throughout the year. Production at the Berkeley pit reached 17,500 tons of ore per day in mid 1957, and this rate was maintained throughout the remainder of the year. Work progressed on an inclined conveyor tunnel extending from a railroad ore-loading yard to the bottom of the Berkeley pit. The crusher will be located under a part of the pit from which the crushed ore will be transported by conveyor belt to ore bins beside the railroad. An unusual feature of

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All of the reported uranium ore shipments from Montana came from the Pryor Mountain area of Carbon County which lies south of Billings. This district extends into Wyoming.

Iron ore was again produced in Montana by the Young-Montana Corporation which mined high-grade magnetite and shipped it to Great Lakes furnaces.

Manganese production figures remained about the same as for 1956 with the Emma mine in Butte accounting for the major portion of the output. However, many small producers in the Butte, Philipsburg, and White Sulphur Springs area again contributed to this total in 1957. The government program for buying manganese ore was extended in this area until mid-1958.

The amount of chromite produced in 1957 was about the same as for 1956. All of the chromite was mined by the American Chrome Company in its operations near Nye. The company sunk a shaft in 1957 and actively pursued an extensive development program to prove ore reserves at depth.

For the most part, non-metallic production figures were similar to those of 1956. Flourspar production increased slightly, and Cummings & Roberts, main producers in Ravalli County, built a beneficiation plant. Phosphate production also increased with Victor Chemical Company, Montana Phosphate Products Company, J. R. Simplot Company, and George Relyea accounting for practically all of the production. This ore was produced from both open pit and underground operations.

Nevada

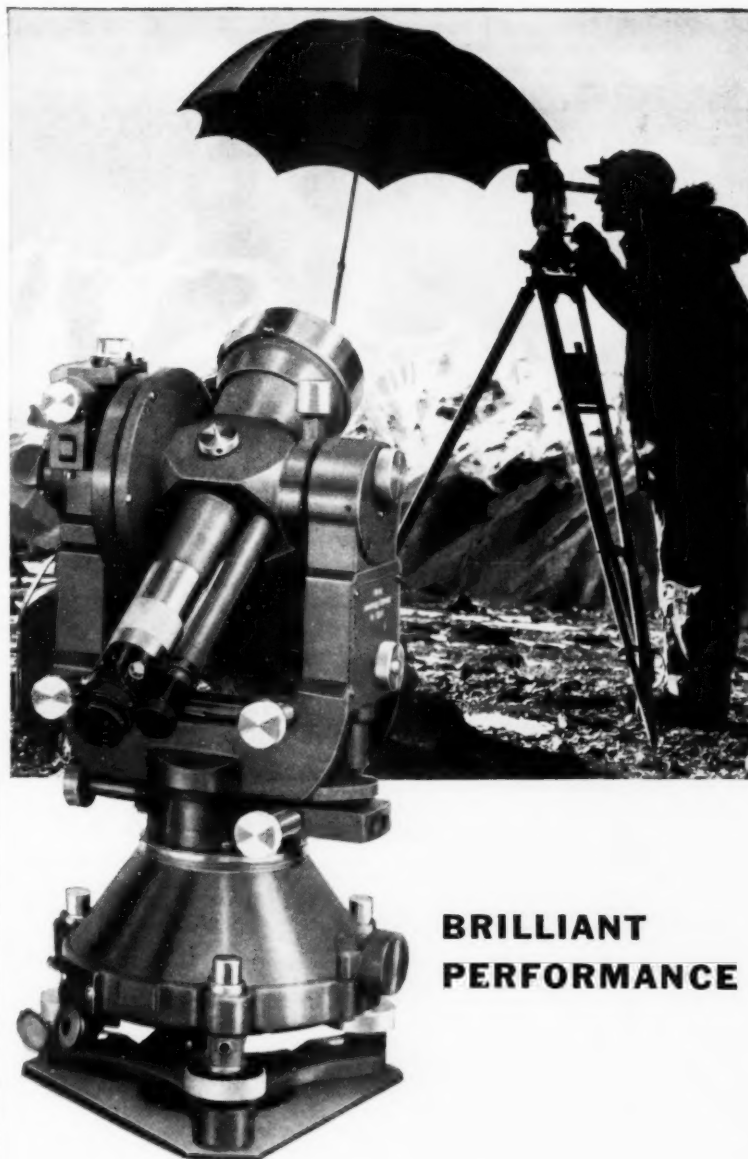
● Consolidated Coppermines Sold to Kennecott; Big Gold Mining Project Shapes-Up

The value of Nevada's 1957 mineral production dipped steeply below the all-time high of \$126,235,000 recorded in 1956. Preliminary estimates place the 1957 mine output at \$83,411,000.

Copper production declined from 82,883 tons in 1956 to 77,000 tons in 1957. Perhaps a more accurate reflection of the picture can be gained from copper production rates during the year. Copper was produced at a rate of 7,060 tons in January 1957, but by December of the year copper production had slowed to 6,020 tons per month.

The most significant event of 1957 was the negotiation between Kennecott Copper Corporation and Consolidated Coppermines Corporation for the purchase by Kennecott of Coppermines' holdings in White Pine County. After the start of the new year, Kennecott completed the purchase which included Consolidated Coppermines' Tripp open pit; Coppermines' share of ore reserves in Kennecott's adjacent Liberty and Veteran pits; and numerous Consolidated Coppermines claims, surface buildings, water rights and equipment. Both companies had worked side by side for years.

In the Yerington District, Nevada's only other major copper producer, The Anaconda Company at Weed Heights, continued treating oxide copper ore in its leaching plant. Estimated Anaconda



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New Mexico Production of Potash, Gold, Silver, Copper, Lead, and Zinc and Dollar Value from 1941 Through 1957 For Base Metals Only

Year	Potassium Salts K.O. Equivalent Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	433,677	27,845	1,328,317	73,478	4,668	37,862	\$25,471,416
1942	548,730	11,961	676,170	80,100	4,608	46,461	29,542,885
1943	604,414	5,563	463,583	76,163	5,723	59,524	34,042,378
1944	679,721	6,918	535,275	69,730	7,265	50,727	32,178,026
1945	733,176	5,604	465,127	56,571	7,662	40,295	26,386,781
1946	789,473	4,009	338,000	50,191	4,899	36,103	26,552,417
1947	880,605	3,146	515,833	60,205	6,383	44,103	38,374,269
1948	967,045	3,414	537,674	74,687	7,653	41,502	46,799,576
1949	932,497	3,249	380,855	55,388	4,652	29,346	31,029,120
1950	1,072,722	3,414	338,581	66,300	4,150	29,263	37,437,915
1951	1,217,717	3,959	443,267	73,558	5,846	45,419	54,697,048
1952	1,411,125	2,949	479,318	76,112	7,021	50,975	56,559,692
1953	1,562,851	2,614	205,000	72,477	2,943	13,373	45,725,959
1954	1,732,240	3,539	109,132	60,558	887	6	36,196,189
1955	1,826,118	1,917	66,417	66,417	3,296	15,277	54,581,760
1956	1,930,754	3,257	392,967	74,345	6,042	35,010	75,153,458
1957 ¹	2,028,000	3,600	311,400	65,500	5,350	30,900	48,355,600

1. Estimate by U. S. Bureau Mines.

copper production of \$17,000,000 during 1957 was substantially below the approximate \$25,000,000 output recorded by Anaconda in both 1955 and 1956.

Increased interest was shown in gold properties throughout the state. Largest undertaking was that of Round Mountain Gold Dredging Corporation, Fresno Company subsidiary, on property leased from Nevada Porphyry Gold Mines, Inc. in Nye County. Morrison-Knudsen is stripping 33,155,000 yards of overburden from the placer deposit to develop an estimated 38,722,000 yards of ore. Remodeling and expansion of the Round Mountain mill was started in order to handle approximately 250,000 yards of \$0.75 to \$1.00 gold ore per month. Milling was reported to have started in March 1958.

Both lead and zinc production was down. Combined Metals Reduction Company, Nevada's leading lead-zinc producer in 1957 and former years, ceased mining operations in the Pioche District in August 1957. Important lead tonnage was recovered from the Ruby Hill mine of Eureka Corporation and Consolidated Eureka Mining Company in Eureka county. Both companies produce a relatively high-grade lead-silver ore, and so far have been able to continue output on a limited scale.

Iron ore production declined 165,000 tons in 1957 compared to 1956 output. Mineral Materials Company began operation of a 300-ton-per-hour dry magnetic separation plant near Lovelock. Shipments of manganese ore and concentrate rose above the 1956 level. Manganes Inc. was the largest producer. Producers from White Pine County and Combined Metals Reduction Company, Pioche District, shipped ore to the Butte purchase depot.

Mercury output was up a few hundred flasks. Cordero Mining Company was the major producer. Interest in mercury flotation grew during the year. The tungsten industry virtually collapsed with the closing of the domestic purchase program. Only Nevada-Massachusetts Company and Gabbs Exploration were reported actively mining and milling tungsten ore at years end. In 1956, 139 producing tungsten properties were listed.

Basic Incorporated, one of the Nation's largest magnesite producers, planned a \$1,500,000 expansion and improvement of facilities at Gabbs. Magnet Cove Barium Corporation completed installation of barite flotation and pulverizer additions to the Battle Mountain plant.

New Mexico

● Major Discoveries Make this Largest U₃O₈ State; Sink 14 Ambrosia Shafts

During 1957 New Mexico increased its position as the number one uranium state in terms of discoveries, tonnage of ore developed, mill tonnage under construction, and tons of ore mined. This activity was centered in the greater Laguna-Grants-Ambrosia Lake district. The Ambrosia Lake district was extended southeast, east, west, and northwest by drilling, much of it deep, during the year. Grants-Ambrosia Lake district. The Ambrosia Lake district was extended southeast, east, west, and northwest by drilling, much of it deep, during the year with major ore discoveries made or announced by Calumet & Hecla, Inc.; Rare Metals Corporation of America; Four Corners Exploration Company; Phillips

Petroleum Company; Yucca Mining & Petroleum Company; Mineral Project Venture B; and others. Extensions to previously discovered ore bodies were also made by drilling by the larger operators. The Atomic Energy Commission announced on 20 November that reserves totaled 51,400,000 tons of 0.26 percent U²³⁵ ore. This was about 68 percent of United States reserves.

At year's end Anaconda Company was operating its 3,000 ton Bluewater mill at over capacity treating Jackpile open pit sandstone ore and limestone ore from mines north of the mill. Kerr-McGee Oil Industries, Inc. operated its 500 daily ton solvent extraction mill at Shiprock throughout the year treating company and custom ore (some from southern end of Ambrosia Lake). Four mills were being rushed to completion with the Homestake-New Mexico Partners 750 ton mill scheduled to start early in 1958 to treat Rio de Oro Uranium. Mines Inc., and Homestake-Partners Section 32 mine ore. Homestake-Sapin Partners new 1,500 ton mill and Phillips Petroleum Company's 1,750 ton mill are scheduled for mid-1958 operation. The 3,300 ton Kermac Nuclear Fuels Corporation mill which will be world's largest producer is scheduled for operation in early 1959. At year's end 14 major shafts were being sunk in Ambrosia Lake to develop mines to supply ore for these four new mills.

Kennecott Copper Corporation's Chino Mines Division started major plant improvements during the year to reduce costs and raise efficiency. A 16,500 kilowatt hour steam turbine generation plant was under construction and new equipment purchased for the pit. Stripping was started to develop the Niagara ore body near Santa Rita pit. Chino Mines continued as largest copper and molybdenum producer.

Production of potash salts in the Carlsbad district reached an all time high of just over 2,000,000 tons during the year by the six producing mines. The record was made possible by the new mine of National Potash Company (Freeport Sulphur Company-Pittsburg Consolidation Coal Company). The Farm Chemical Resources Development Corporation completed its first shaft late in the year and started pilot plant testing of ore cut by the shaft. Potash Company of America was building two new plants at its refinery to produce granular potash products. International Minerals & Chemicals Corporation also added equipment to increase granular capacity and installed new mining equipment. Other potash producers were: Duval Sulphur and Potash Company, Southwest Potash Company, and U. S. Borax and Chemical Corporation.

Nevada Production of Metals From 1941 Through 1957. Dollar Value Shown For Base Metals Only

Year	Iron Ore Long Tons	Manganese 35% or More Mn Tons ^a	Tungsten 60 Percent WO ₃ Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	241	2,937	2,289	366,403	5,830,238	78,911	9,623	15,129	\$38,959,420
1942	—	6,112	3,052	295,112	3,723,435	83,663	5,378	10,197	35,840,168
1943	7,368	10,451	2,910	144,442	1,620,280	71,068	4,790	13,647	28,351,601
1944	36,581	19,800	2,665	119,056	1,259,636	61,232	6,605	20,699	27,371,513
1945	6,196	874	1,857	92,265	1,043,380	52,595	6,275	21,457	24,186,294
1946	3,299	1,067	2,617	90,680	1,250,651	48,616	7,175	22,649	27,026,416
1947	5,452	67	2,002	89,063	1,337,579	49,603	7,161	16,970	31,366,282
1948	8,945	—	949	111,532	1,790,020	45,242	9,777	20,288	34,055,480
1949	3,094	—	740	130,399	1,800,209	38,058	10,626	20,443	29,615,777
1950	5,465	—	1,123	178,447	1,537,217	52,569	9,408	21,606	38,181,872
1951	331,327	58	1,482	121,036	981,669	56,474	7,148	17,443	41,280,596
1952	912,084	105	2,329	117,203	941,195	57,537	6,790	15,357	40,086,746
1953	444,081	20,510*	3,233	101,799	697,086	61,850	4,371	5,812	42,177,725
1954	351,250	88,220*	4,696	79,067	560,182	70,217	3,041	1,035	45,759,162
1955	324,602	102,000*	6,155	72,913	845,397	75,925	3,291	2,670	63,832,670
1956	916,592	121,482	5,400	72,646	1,220,473	82,883	6,384	7,488	78,154,038
1957 ¹	751,000	129,000	1,400	75,400	952,700	77,700	5,800	5,000	52,941,600

1. Estimated by U. S. Bureau of Mines; * Long tons;
2. Shipments to Government low-grade depots and custom mills not included.

Oregon

● Metallurgical Industry Is Still Growing; Uranium Mill Construction Approved by AEC

Oregon's growing metallurgical industry could boast two new developments in 1957. First, Oregon Metallurgical Corporation announced that the company had been awarded a \$4,000,000, one year contract for production of ingots of zirconium metal for delivery to Westinghouse Electric Corporation. Raw material will be sponge zirconium metal supplied by Wah Chang Corporation. Second, Wah Chang officially dedicated its new zirconium sponge plant at Albany last year; about a month later Wah Chang started building a zirconium purification addition to the sponge plant.

Uranium made the news in Oregon during 1957 with the announcement in October of A. E. C. approval for construction of a 200-ton-per-day processing plant near Lakeview, Oregon by Lakeview Mining Company. Anticipated cost of the plant is \$2,600,000.

About 1,000,000 tons of nickel ore was mined by open-pit methods by Hanna Coal and Ore Corporation near Riddle, Douglas County. The ore averaged about 1.5 percent nickel. The nearby smelter of Hanna Nickel Smelting Company turned out some 41,000,000 pounds of ferronickel, highest since the plant went into operation, containing 18,000,000 pounds of nickel. Late in the year the smelter upped capacity of its ore preparation system by one-third.

Mercury production was estimated at 3,870 flasks, more than double the 1956 figure and the highest since 1943. Under the management of Arentz-Comstock Mining Venture of Salt Lake City, the old Bretz mine in Malheur County's Opalite district came back after a 10-year shutdown to rank as the state's leading producer.

South Dakota

● Homestake Drives Deeper; Solvent Extraction Unit To Be Installed at Edgemont

Production of metal ore in 1957 just about held its own with respect to 1956 output. Homestake Mining Company at Lead increased production of gold and silver from its underground mine slightly; the production of Bald Mountain Mining Company, near Lead, declined considerably. The net result was a 2 percent drop in gold and a 6 percent drop in silver production for the state in 1957.

Development work continued below the 5,000-foot level at Homestake's famous producer. An interior winze was sunk to the 5,705-foot mark and drifts are being advanced along the ore zones on the 5,300- and 5,600-foot levels. Two-stage hoisting will be required for production originating below the 5,000-foot level, and this will probably contribute to somewhat higher costs. Work continued on a ventilation shaft which is being sunk from the surface and raised from underground workings.

Production of uranium ore in 1957 was estimated to be nearly 3 times greater than in 1956. Mines Develop-

Oregon Production of Nickel, Mercury, Chromite, Gold and Silver. Dollar Value of Gold and Silver Output Given for 1941 Through 1957

Year	Nickel Tons*	Mercury Flasks	Chromite Tons	Gold Ounces	Silver Ounces	Dollar Value
1941	9,032	840	96,525	276,158	\$3,576,154
1942	6,936	2,683	46,233	87,376	1,680,289
1943	4,651	16,363	1,097	10,527	45,878
1944	3,159	7,818	1,369	20,243	62,310
1945	2,500	4,366	4,467	10,461	163,874
1946	1,326	NA	17,598	6,927	621,527
1947	1,185	—	18,979	30,379	691,758
1948	1,351	3,345	14,611	13,596	523,690
1949	1,167	—	16,226	12,195	578,947
1950	5	—	11,058	13,565	399,307
1951	1,177	754	7,927	6,218	283,073
1952	868	6,591	5,509	4,037	196,469
1953	648	6,216	8,250	6,930	295,022
1954	1,993	491	6,665	14,335	241,174
1955	4,181	1,056	5,341	8,815	67,758
1956	6,866	1,893	54,577	13,542	108,086
1957†	15,000	3,870	7,800	(3)	(4)

1. Estimated by U. S. Bureau of Mines. 2. Nickel content of ore.
3. Production not available, but estimated to be greater than 1956.
4. Production not available, but estimated to be greater than 1956.

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South Dakota Production of Gold, Silver, Feldspar, and Beryllium from 1941 Through 1957. Dollar Value for Gold and Silver only.

Year	Feldspar (Crude) Long Tons	Beryllium Conc. Tons	Gold Ounces	Silver Ounces	Dollar Value
1941	59,015	151	600,637	170,771	\$21,143,732
1942	56,449	205	522,098	186,937	18,406,363
1943	70,913	238	106,444	35,886	3,751,059
1944	64,806	306	11,621	5,445	410,607
1945	68,374	38	55,948	26,564	1,977,070
1946	74,540	95	312,247	86,901	10,998,861
1947	58,959	70	407,104	111,684	14,359,766
1948	54,037	45	377,850	94,693	13,323,894
1949	32,272	69	464,650	109,383	16,363,011
1950	43,875	96	567,996	142,069	20,008,436
1951	48,559	138	458,101	139,590	16,159,871
1952	40,163	334	482,534	132,107	17,008,249
1953	50,601	392	534,987	151,407	18,850,023
1954	44,498	337	541,445	154,092	19,087,606
1955	42,164	294	529,865	134,092	19,109,068
1956	45,164	195	568,523	136,118	20,310,537
1957 ¹	40,000	260	556,400	128,000	20,195,660

1. Estimated by U.S. Bureau of Mines.

ment, Inc. completed the first full year of operation of its RIP uranium plant at Edgemont. Initially designed to treat 200 tons of ore per day, mill feed consistently exceeded 400 tons per day in 1957. The excess tonnage was allowed under a special agreement with the Atomic Energy Commission. Subsequently Mines Development received AEC permission to permanently expand capacity to 400 tons per day. An important addition to the expansion program will be the installation of a solvent extraction unit.

A partial list of shippers to the Edgemont mill include Anschutz Drilling Company, Giant Cycle Corporation, Black Hills Uranium Company, Jenkins and Hand, Sodak Uranium & Mining

Company and Pictograph Mining & Uranium, Inc.

Output of beryllium concentrate and columbium-tantalum concentrate rose sharply in 1957. At the Ingersoll Mine, near Keystone, development work was carried out on a third pegmatite dike and a fourth pegmatite was diamond drilled. Principal production from two dikes mined in the past has consisted of lepidolite, amblygonite and beryl.

Southeast

● Union Carbide To Dredge Black Sands; Bear Creek Drills For Phosphate

In spite of the generally poorer market for minerals during 1957, production held up quite well in the southeast. Few cutbacks in any metals occurred until the latter part of the year.

In North Carolina, Appalachian Sulphides, Inc., completed development of its Ore Knob property and got up to a 400 ton-per-day output of copper ore. Even though the outlook for copper is drab, the shaft will be deepened in 1958 in order to develop two additional levels.

Tungsten mining was hardest hit of all mining in the Southeast. Tungsten concentrate tonnage in North Carolina was down 15 percent, but the value of 60 percent WO₃ concentrate decreased more than 50 percent according to a United States Bureau of Mines report.

Florida again was the second largest mineral producer in the southeast, principally because of heavy-mineral black sands and phosphate. However the 35 percent increase in phosphate production recorded in 1956 was not repeated last year. Instead the year ended with slightly over 10,000,000 tons of pebble rock production and about 50,000 tons from the hard rock field. This was a slight drop from the 11,822,145 tons mined in 1956.

Florida Production of Phosphate Rock, and Titaniferous Minerals (ilmenite, rutile and zircon) From 1950 through 1957

Year	Phosphate Rock Long Tons	Titanium Minerals Tons
1950	8,085,870	(2)
1951	8,496,831	(2)
1952	8,781,125	(2)
1953	9,331,002	178,818
1954	10,437,197	182,421
1955	8,747,282	238,500
1956	11,822,145	283,956
1957 ¹	10,599,000	268,479

1. Estimated by U.S. Bureau of Mines.

North Carolina Production of Feldspar and Tungsten From 1950 through 1957

Year	Feldspar Long Tons	Tungsten Conc. (60% WO ₃) Tons
1950	183,027	1,088
1951	166,361	1,041
1952	240,364	1,254
1953	268,062	2,074
1954	230,744	2,538
1955	242,724	2,609
1956	255,637	2,732
1957 ¹	261,000	2,328

1. Estimated by U.S. Bureau of Mines.

In the Florida phosphate field, American Cyanamid Company started a new triple superphosphate plant at Brewster. The company also started the Orange Park operation and closed the Saddle Creek mine. Coronet Phosphate Company enlarged potassium silicofluoride facilities. Armour Fertilizer Works completed its second year of mining at the new Bartow mine.

During the year Union Carbide Corporation announced that it would use a 9-cubic-foot, connected bucket-line dredge to recover heavy minerals from sands of Amelia Island off Florida's east coast. Rutile and ilmenite concentrates will be used to produce titanium sponge at Ashtabula, Ohio.

Lithium continued to be a quite active phase of the mining industry of North Carolina. Foote Mineral Company continued to be the major producer of concentrates, and the only company actively mining ore in the State. Lithium Corporation of America continued to receive its mill feed from Canada. The greatest activity was by other groups interested in developing idle deposits, and considerable surface and subsurface exploration was done by Basic Atomics, Inc., Lincoln Lithium Corporation, Universal Lithium Corporation, and National Lithium Corporation.

Production capacities of the feldspar industry in North Carolina were increased considerably with the completion of Lawson Feldspar Corporation's plant near Spruce Pine. This plant is to produce feldspar concentrates from alaskite.

Perhaps the most significant development in North Carolina was the exploration program for phosphate in Beaufort County, eastern North Carolina. Bear Creek Mining Company and General Crude Petroleum Company have drilled enough holes to indicate that large deposits of medium to low grade phosphate exist in the area. So far the deposits have been traced from 45 to more than 250 feet below the surface.

In Alabama, shipments of iron ore increased 6 percent over 1956 to 13,030,000 long-tons.

Tri-State

● Lead and Zinc Output Take A Steep Dive; Many Producers Forced To Close

Output of recoverable lead fell from 20,400 tons in 1956 to 10,800 tons in 1957. The 1957 production was the lowest recorded since the 1880's. Zinc presented a similar pattern. Recoverable zinc production in the district amounted to

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Oklahoma Production of Lead, and Zinc From 1941 Through 1957

Year	Lead Tons	Zinc Tons
1941	25,021	166,602
1942	22,806	146,510
1943	19,733	114,085
1944	13,944	91,449
1945	12,664	69,300
1946	13,697	69,552
1947	14,289	51,062
1948	16,918	43,821
1949	19,858	44,033
1950	20,724	46,739
1951	16,575	53,450
1952	15,137	54,916
1953	9,304	33,413
1954	14,204	43,171
1955	14,126	41,543
1956	12,350	27,515
1957 ¹	6,500	14,300

1. Estimated by U.S. Bureau of Mines.

30,100 tons in 1957 compared with 57,200 tons in 1956.

All of the mines and the Central mill of the Eagle Picher Company, largest lead and zinc producer in the district, were closed during May of 1957 and from August to the end of November. National Lead Company operated the Ballard group of mines, second largest zinc producer in the district, throughout the year. These operations were closed, however, at the start of 1958.

Missouri Production of Lead, and Zinc, Copper, and Silver from 1941 Through 1957

Year	Lead Tons	Zinc Tons	Copper Tons	Silver Fine Ounces
1941	165,909	21,932	1,400	169,027
1942	199,548	36,394	1,300	69,106
1943	184,910	30,413	1,340	111,285
1944	174,683	36,626	3,302	92,243
1945	176,575	22,175	3,399	94,822
1946	139,112	22,234	1,857	69,401
1947	132,246	17,074	1,760	93,600
1948	102,288	6,463	2,370	114,187
1949	127,522	5,911	3,670	123,413
1950	134,626	8,189	2,282	236,273
1951	123,702	11,476	2,422	184,424
1952	129,245	13,986	2,656	517,432
1953	125,895	9,981	2,374	359,781
1954	125,250	5,210	1,925	352,971
1955	125,412	4,476	1,722	438,000
1956	123,783	4,380	1,890	295,111
1957 ¹	125,000	3,000	1,800	240,111

1. Estimated by U. S. Bureau of Mines.

Tennessee

● Zinc Output Establishes New Annual Record; Activity In Exploration at High Level

Zinc production soared 23 percent in 1957 and established a new annual record. For most other metals and non-metallic ores, a decline in output resulted last year. This was especially noticeable in the latter part of the year.

The East Tennessee zinc district, where production has been mushrooming in recent years, saw curtailment at some companies. Tennessee Coal and Iron Company put its Jefferson City mine on a four day week with a consequent reduction of 25 per cent in their output. American Zinc Company of Tennessee closed down its Grasselli mine at New Market, but brought its Coy mine into limited production and increased output at its Young mine. New Jersey Zinc Company kept its 1,000-ton-per-day mine operating at Jefferson City, but failed to start operations at Treadway, where a new 2,000 ton-per-day mine has been developed.

At the end of the year the total daily

Tennessee Production of Phosphate Rock, Gold, Silver, Copper, Lead, Zinc and Dollar Value from 1950 Through 1957

Year	Phosphate Rock Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1950	1,384,473	160	39,958	6,851	113	35,326	\$22,983,278
1951	1,419,892	108	24,960	7,069	14	38,639	28,121,844
1952	1,452,508	241	57,569	7,620	18	38,020	27,267,054
1953	1,622,170	293	68,935	7,829	9	38,465	25,666,924
1954	1,633,226	218	60,759	9,087		30,326	27,716,838
1955	1,465,902	221	66,619	9,911		40,216	27,881,089
1956	1,685,003	189	64,878	10,449	5	46,023	33,201,978
1957 ¹	1,635,000	139	47,232	9,940		56,467	30,821,610

1. Estimated by U.S. Bureau of Mines.

production of zinc ore from the entire district was probably around 7000 tons. Should demand for lead-free zinc improve during 1958, production could easily be raised to 10,000 tons per day.

The state's only copper producer is Tennessee Copper Company at Copper-

hill, Tennessee, where 1957 production was 5 percent lower than last year. Tennessee Copper Company's production is more closely related to the sulfuric acid market in the southeast than to the world copper market. The Company's major construction program, started in 1956 to

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*CUTAWAY STYLE
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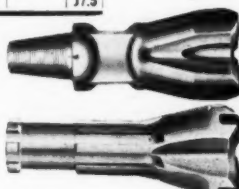
BIT SIZE		THREAD DESIGNS AVAILABLE									
1 1/4"	A					112	113				
1 1/2"		F				112	113				
1 3/4"		F	H			113	115	Type 0			#200
1 3/4"		F	H			113	115	Type 0			#200
1 3/4"			H	D			115	Type 0	Type 1		#200
1 3/4"			H	D			115	Type 1	Type 1		#200
2"			H	D			115	Type 1	Type 2		#200
2 1/4"			H	D			115		Type 2		#200
2 1/4"			H	D			115	118	Type 2	Type 3	#200
2 1/2"							118	121	Type 2	Type 3	
2 1/2"							118	121	Type 2	Type 3	
2 3/4"							118	121	Type 2	Type 3	
2 3/4"							118	121	Type 2	Type 3	
3"							118	121	Type 2	Type 3	
3 1/4"							118	121	Type 3		

		THREAD DESIGNS AVAILABLE	
CHISEL TYPE	BIT SIZE		
	1 1/2"	F	H
	1 3/4"	F	H
	1 3/4"		D
	1 7/8"		D
	2"		H
	2 1/4"		D
Other threads on special order			D
			D
"X" TYPE (for long hole drilling)			
	1 1/4"	#400	
	2"	#400	
	2 1/4"	#400	
	2 1/4"	#400	
	2 3/4"	#400	
	2 1/2"	#400	#600
	2 3/4"		#600
	3"		#600
	3 1/2"		#600 K
	4"		#600 K
4 1/2"			

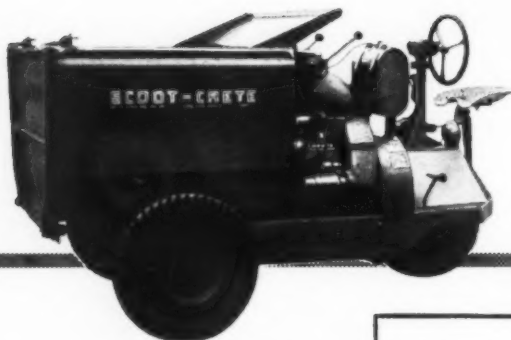
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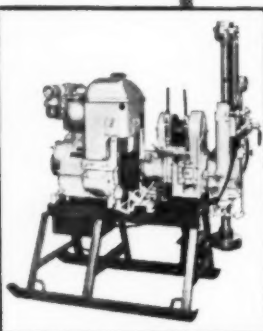
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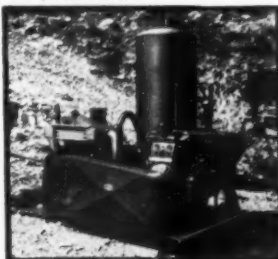
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PARTIAL SPECIFICATIONS TABLE

Model	Cont. BHP/Cont. RPM
F 1 L 612	10/2000
F 2 L 612	20/2000
F 3 L 612	30/2000
F 4 L 612	40/2000
F 6 L 612	60/2000
A/F 2 L 514	30/1600
A/F 3 L 514	45/1600
A 4 L 514	60/1800
A 6 L 514/614	90/1800
A 8 L 614	120/1800
A 12 L 614	180/1800

Also a full range of automotive engines with 4, 6, 8 and 12 cylinders operating at 2300 RPM.

consolidate all flotation operations at London mill, was nevertheless brought to near completion in 1957. The Callo-way mine, under development for several years, is being equipped for full-scale production beginning about the middle of 1958.

The big area of exploration during 1957 was still the East Tennessee zinc district, where nearly \$3,000,000 was spent on Defense Minerals Exploration Administration projects. In addition, Tennessee Coal and Iron Company, a subsidiary of United States Steel, has 7 diamond drills involved in exploration without D.M.E.A. assistance.

National Lead Company bought the options of Putman Exploration Company near New Jersey Zinc Company's Flat Gap Zinc mine and continued diamond drilling on the basis of geo-chemical anomalies. D.M.E.A. assisted National Lead in this exploration program with an \$85,063 loan.

Production of phosphate ore in Central Tennessee slipped slightly to 1,635,000 tons from the record high of 1,685,003 tons established in 1956. Tennessee Products Company, principally a producer of ferrosilicon, closed down one of its two blast furnaces. This resulted in a 20 percent decline in limonite ore supplied to the plant.

Utah

● U₃O₈, Potash, Gilsonite and Phosphate attract Attention; Kennecott Begins Pyrite Study

Metal output, though plummeting 26 percent, still accounted for 75 percent of the mineral output of Utah in 1957. Non-metallics were the bright spot in the picture with many new developments taking place during the year and several others planned for the future.

Copper again was the leading mineral commodity; 1957 production totalled 233,800 tons compared to 250,604 tons in 1956. Kennecott Copper Corporation, Utah Copper Division announced an \$18,000,000 improvement program. Of this amount \$16,000,000 will be spent for expansion of the company's central power station at Magna. Utah Copper pushed activities on an 18-by 24-foot haulage tunnel to connect the bottom of the Bingham Canyon open pit with the Copperton railroad assembly yards. The tunnel is to be concrete-lined and will be about 18,000 feet long when completed. Utah Construction Company is driving the heading under contract.

Recoverable lead production fell about 5,000 tons to a 44,000-ton output in 1957. United States Smelting Refining and Mining Company, operator of the U. S. and Lark mine at Bingham, was again the largest producer by far. Centennial Development Company sunk a 1,000-foot shaft in the Tintic District under contract for Bear Creek Mining Company. A Cryderman mucker was used in the shaft. The shaft provides depth for silver-lead-zinc exploration by Bear Creek. In November 1957 the shaft was bottomed and 200 feet of advance had been made toward a core drill hole which reportedly had cut ore. Bear Creek is doing the exploration under a working agreement with a group of five companies in the East Tintic district.

Production of uranium ore was considerably higher in 1957. During the



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Utah Production of Iron Ore, Gold, Silver, Copper, Lead, Zinc and Dollar Value of Base and Precious Metals from 1941 Through 1957

Year	Iron Ore Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	397,607	356,501	11,395,485	266,838	69,601	42,409	\$ 97,796,623
1942	359,558	391,544	10,574,955	306,691	71,930	45,543	113,552,848
1943	922,959	390,470	9,479,340	323,989	65,257	46,896	124,562,540
1944	1,542,284	344,223	7,593,075	282,575	52,519	38,994	111,036,247
1945	1,931,749	279,979	6,106,545	226,376	40,817	33,630	90,018,641
1946	1,317,176	178,533	4,118,453	114,284	30,711	28,292	60,202,627
1947	2,823,853	421,662	7,780,032	266,533	49,698	43,673	158,624,849
1948	3,233,413	368,422	8,045,329	227,007	55,950	41,490	149,763,677
1949	2,712,390	314,058	6,724,880	197,245	53,072	40,670	121,649,828
1950	3,139,926	457,551	7,083,808	278,630	44,753	31,678	159,415,431
1951	4,726,159	432,216	7,310,665	271,086	50,451	34,317	182,897,139
1952	4,060,003	435,507	7,194,109	282,894	50,210	32,947	185,780,497
1953	4,617,288	483,430	6,725,807	269,496	41,522	29,184	195,289,033
1954	3,040,646	403,401	6,179,243	211,835	44,972	34,031	164,367,236
1955	3,847,402	441,206	6,250,565	232,949	50,452	43,556	202,628,713
1956	4,001,734	416,031	6,572,041	250,604	49,555	42,374	260,693,260
1957 ¹	4,151,000	376,900	6,190,400	233,800	44,200	40,200	181,049,700

1. Estimated by U. S. Bureau of Mines

year, Uranium Reduction Company dedicated its new 1,500 ton, acid-leach, RIP plant, though actual operation of the mill started in November 1956. Texas Zinc Minerals Company began operation of Utah's first solvent extraction uranium mill at Mexican Hat in November 1957. Rated at 750 tons per day, the Mexican Hat mill features a flotation circuit to recover important quantities of by-product sulphides occurring in the ore. Phase disengagement in the solvent extraction circuit at Texas Zinc is carried out in a unique centrifugal contactor. Vitro Uranium Company finished converting the Salt Lake City mill to solvent extraction during the year.

Mining of solid fuels attracted a great deal of attention during the year. American Gilsonite Company officially dedicated a mine at Bonanza, Utah, and a refinery at Gilsonite, Colorado, in August 1957. Gilsonite, a brittle, solid, hydrocarbon, which is highly explosive when finely divided, is stoped at the Bonanza underground mine with high pressure water-jets. The slurry drains to the shaft where it is pumped to the surface. On reaching the surface the pulp is pumped 72 miles through a 6-inch pipeline to the refinery where thermal cracking produces gasoline and metallurgical coke.

Iron ore shipments in 1957 advanced 4 percent over the 1956 total. Major producers were Columbia Iron Mining Company, subsidiary of United States Steel, from the Desert Mound and Iron Mountain mines; and Colorado Fuel & Iron Corporation. Utah Construction Company also produced important quantities of iron ore from Utah mines.

Calera Mining Company completed conversion of the Garfield cobalt refinery from hydrogen reduction to electro-winning. The new process produces higher

grade cobalt at less cost. Capacity of the plant is 8,000 pounds of cobalt daily.

San Francisco Chemical Company leased the Humphreys phosphate deposit, 15 miles north of Vernal, and with affiliate Stauffer Chemical Company, will move into the elemental phosphorous field. Mining and beneficiation, to be geared to elemental phosphorous production, will be handled by San Francisco Chemical. Stauffer Chemical will build the electric furnace plant. The Humphreys deposit is said to be low grade, averaging about 21 percent P₂O₅. Underground phosphate operations were carried on by San Francisco Chemical in the Crawford Mountains at the Arikaree and Cherokee mines.

Washington

● Lead Mined at Record Pace During 1957; Dawn Uranium Mill Reaches Full Capacity

The Northwest's first uranium processing plant began operations in August at Ford, about 45 miles northwest of Spokane in Stevens county. But the state's only large copper mine and its largest zinc-lead mine were closed during the year and metal mining generally was at low ebb because of low metal prices. Mineral production was valued at \$57,200,000, down \$4,400,000 from 1956. Lead output set a new record in 1957.

The uranium plant, operated by Dawn Mining Company, treated about 440 tons of ore daily although its rated capacity was 400 tons. Most of the ore came from the firm's Midnight mine in the adjacent Spokane Indian Reservation, where Isbell Construction Company mined from several open pits under contract. Midnight

reserves are reportedly sufficient for 5 years of mill operation.

Daybreak Uranium, Inc., started trucking ore to the Ford mill in September from its Mount Spokane (northern Spokane County) open-pit operation and by year's end had shipped 5600 tons valued at more than \$100,000. North Star Uranium, Inc., made an initial 500-ton shipment from the Mount Spokane district late in the year.

Uranium exploration was at a slower pace than in the two previous years and was centered in and around the Spokane Indian Reservation. Northwest Uranium Mines resumed downhole drilling in an attempt to add to proven ore reserves. Western Uranium Mines, Inc., drilled encouraging mineralization adjoining the Midnight mine. So did Spokane National Mines, which was formed late in the year by Wyoming interests to take over Dahl Uranium Mines, Big Smoke Uranium, Inc., and others. Geo-Resource Corporation found indications of a buried uranium deposit by soil sampling and started downhole drilling with aid of a Defense Minerals Exploration Administration loan.

Washington's largest underground zinc-lead mining operation, that of Pend Oreille Mines and Metals Company in Pend Oreille County, continued on a six-day week until the end of the year and then cut to a five-day week. Both the Pend Oreille mine and American Zinc, Lead and Smelting Company's nearby Grandview mine stepped up their lead outputs with the result that the state's lead production hit a new high. Direct-shipping grade lead ore was shipped from the Gladstone mine, Stevens County, by A. G. Lotze, lessee, and he started a new shaft on the boundary line of the adjoining old Electric Point mine, which he also has under lease. Utahcan, Inc., uncovered a number of lead-zinc-silver veins by surface bulldozing in Pend Oreille County's Jim Creek area and began construction of a mill.

Knob Hill Mines, Inc., at Republic, Ferry County, continued as the state's leading gold and silver producer and made a rich strike at depth in the adjoining leased Gold Dollar property owned by Day Mines, Inc., of Wallace, Idaho. Lovitt Mining Company, Wenatchee, Chelan County, again ranked second in gold production.

Output of magnesite by Northwest Magnesite Company, the largest producer of crude magnesite in the United States, was estimated to be slightly higher than in 1956.

Wyoming

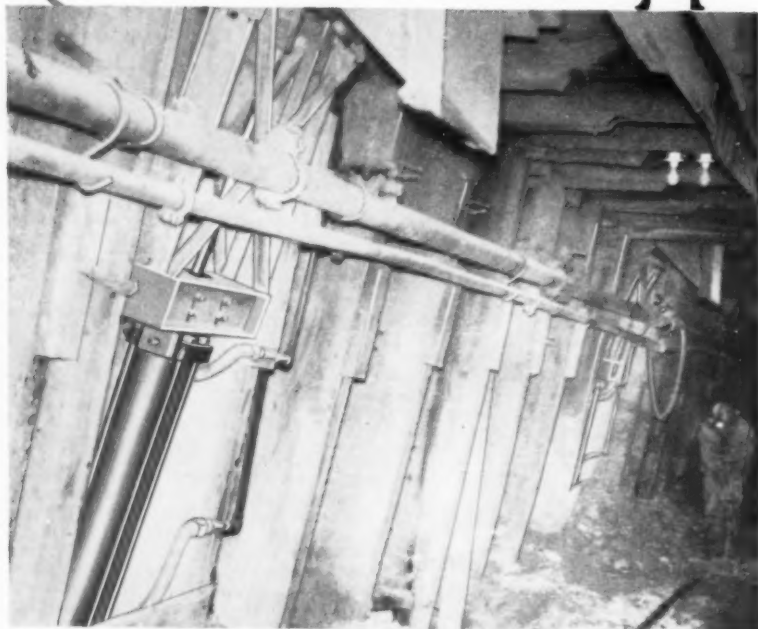
● Big Increase in Uranium Ore Reserves; Iron Ore Project Still Speculated

1957 was marked by the completion and dedication of Wyoming's first uranium mill, the 450-ton-per-day plant of Western Nuclear Corporation at Jeffrey City in the Crook's Gap area of Fremont county. Also, construction was initiated in March on Lucky Mc Uranium Corporation's 750-ton mill in the Central Gas Hills, and in December the AEC granted permission to Fremont Minerals, Incorporated, a subsidiary of Susquehanna Corporation, to construct and operate a mill at Riverton with a 500-ton capacity.

Washington Production of Tungsten, Gold, Silver, Copper, Lead, and Zinc. Dollar Value of Base and Precious Metals from 1941 Through 1957

Year	Tungsten* Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	68	84,176	402,030	8,686	3,903	13,320	\$ 7,874,886
1942	45	75,396	369,038	8,030	4,851	14,398	8,172,609
1943	4	65,244	370,440	7,365	5,022	12,203	7,833,012
1944	5	47,277	321,608	6,164	5,825	11,904	7,195,136
1945	2	57,860	281,444	5,281	3,802	11,693	7,140,242
1946	1	51,168	264,453	4,527	2,987	11,329	6,886,748
1947	—	34,965	293,736	2,240	5,359	13,800	7,313,398
1948	—	70,075	375,831	5,665	7,147	12,638	11,171,715
1949	—	71,994	357,853	5,275	6,417	10,740	9,613,307
1950	—	62,117	363,566	5,057	10,344	14,807	12,652,302
1951	9	47,405	344,948	4,089	8,002	18,189	14,030,888
1952	4	54,776	315,645	4,357	11,744	20,102	14,767,054
1953	5	62,560	321,000	3,740	11,064	32,786	15,067,000
1954	18	66,740	313,735	3,636	9,938	22,304	12,305,762
1955	12	74,360	436,348	3,958	10,340	29,536	16,297,361
1956	NA	70,669	448,442	2,926	11,657	25,609	16,043,542
1957 ¹	NA	NA	NA	1,660	12,342	23,139	NA

1. Estimated by U. S. Bureau of Mines. *Tungsten (recoverable content of ores) 60% WO₃. NA—Not available



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3 rd	12.4	12.7	13.0	13.3	13.6	13.9	14.2	14.5	14.8	15.1	15.4	15.7	16.0	16.3	16.6	16.9
4 th	11.7	11.9	12.1	12.3	12.5	12.7	12.9	13.1	13.3	13.5	13.7	13.9	14.1	14.3	14.5	14.7
5 th	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.5
6 th	10.3	10.4	10.5	10.6	10.7	10.8	10.9	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8
7 th	9.6	9.7	9.8	9.9	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	11.0	11.1
8 th	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10.0	10.1	10.2	10.3	10.4
9 th	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7
10 th	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0
11 th	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	8.2	8.3
12 th	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.1	7.2	7.3	7.4	7.5	7.6
13 th	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9
14 th	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0	6.1	6.2
15 th	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0	5.1	5.2	5.3	5.4	5.5
16 th	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8
17 th	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1
18 th	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4
19 th	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
20 th	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0

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Page 224 for charts showing U. S. mine production of key metals from 1900 to 1958.

Page 221 to check Minnesota, Michigan, and Wisconsin mine shipments of iron ore.

Page 222 for listing of tonnages mined at important U. S. open pit mines.

Page 223 to see the rank of the major underground U. S. mines.

Even before construction was completed on Western Nuclear's mill, the company had petitioned the AEC for an increase in capacity to 1,200 tons per day. The plant is reportedly treating over 650 tons-per-day at the present time. When construction was only 3 months along, Lucky Mc presented a proposal, jointly with Phelps Dodge Corporation which had proved vast reserves on Wyoming Uranium Corporation claims in the Crook's Gap district, for an increase in mill capacity to 1,750 tons.

Continued uranium exploration and development, boosted Wyoming ore reserves substantially. Official AEC calculations in June 1957 put Wyoming uranium ore reserves at 5,600,000 tons. At years end, proven uranium ore reserves were estimated at nearly 18,000,000 tons. Vitro Minerals Corporation continued as the largest producer in the Gas Hills area, with a total production of 150,000 tons of ore mined as of the first of December 1957. Large stripping operations were underway at several locations in the Gas Hills. Among the largest were two pits opened by Lucky McG—one 1,100 feet by 400 feet and a second pit further south 1,700 feet by 600 feet. Western Nuclear also continued development of an open pit on the Bullrush ore body in the Gas Hills district.

Columbia-Geneva Division of United States Steel Company continued extensive drilling and development of the large, low-grade magnetite ore properties at Atlantic City. Centennial Development Company did the exploratory work under a contract signed with Columbia-Geneva. There were increasing signs that Columbia-Geneva definitely would proceed with mining the ore and construction of a beneficiation plant, but no official announcement was made. A \$16,000,000 magnetic separation plant is reportedly contemplated for the Atlantic City project.

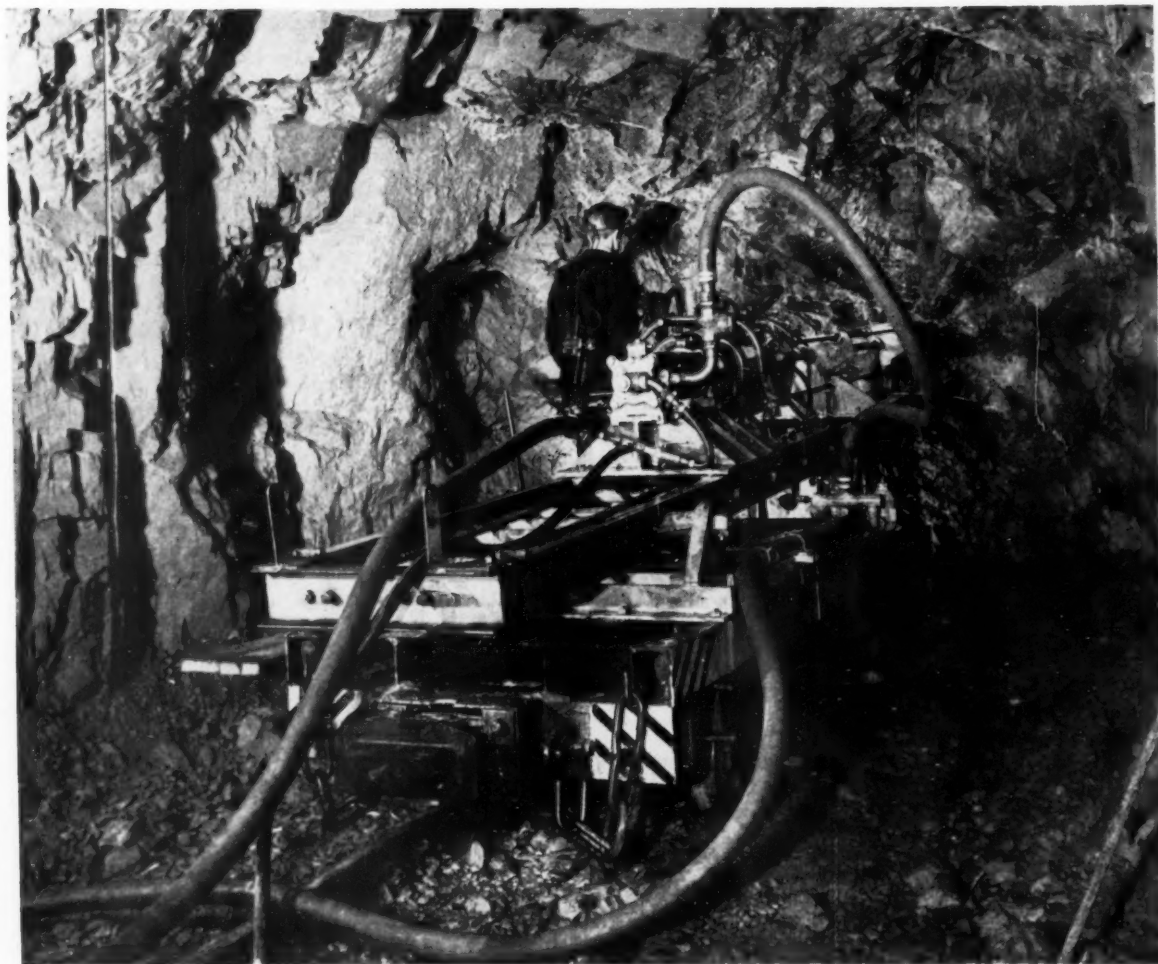
Columbia-Geneva has repeatedly declined to make a public statement.

Iron ore output in Wyoming was up, due largely to an increase in production from the Sunrise mine of Colorado Fuel & Iron Corporation and continued production of iron ore (aggregate) by Magnetite Products Company. During 1957, Colorado Fuel & Iron launched a 2-year project to lower the shaft at the Sunrise mine by 160 feet.

Intermont Chemical Company's soda ash plant at Westvaco near Green River reportedly will be expanded from 350,000 to 400,000 tons annually. Completion of a third shaft at the property in 1956, was the reason given for expanded capacity.

San Francisco Chemical Company completed a flotation plant at Leefe, near the Idaho border, for up-grading phosphate ore, according to reports.

A PICTURE OF World-wide Mining



CARIBBEAN

BRITISH VIRGIN ISLANDS

The British Virgin Islands, forming a geographic and economic unit with the Virgin Islands of the United States, are a Crown Colony composed of Tortola, Anegada, Virgin Gorda, and 25 other islands. The mineral industry continues to be limited to sand, salt, and a little stone for aggregate.

The copper-molybdenum mine at Copper Mine Point, Virgin Gorda, that was worked during the early and middle 19th Century, has been extensively explored by the Jamaican mining company that holds the mineral concession on the area. General geologic mapping of western

Virgin Gorda and detailed geologic mapping of the mine area were carried out and a diamond drill program was under way at the end of 1957, but it is still too early for definite conclusions to be drawn from this work.

CUBA

Cuba's mining industry continued during 1957 the rate of expansion which within a few years has brought it into fourth place as a source of the nation's income.

Cuba today rates as the second largest producer of nickel (after Canada) in the free world, with an output of approximately 15 percent of the world supply. But Cuba production will increase even

more within a few years. The Freeport Sulphur Co. this year launched a \$75,000,000 project to work concessions it holds at Moa Bay, on Cuba's northeast coast. (Freeport also owns the concession at Nicaro, but leases it to the U. S. Government.)

Production is scheduled to begin at Moa in the summer of 1959. The Cuban-American Nickel Company, a Freeport subsidiary, signed an agreement with the U. S. Government under which the latter agreed to purchase the firm's future output from Moa until June 30, 1965 (up to 271,000,000 pounds of nickel and 23,835,000 pounds of cobalt). Purchases will be at prices equivalent to those of March of 1957.

The Cuban government helped the Moa project by granting extensive tax

Caribbean

exemptions to Cuban-American.

The U. S. Government, with the largest investment in Cuban mining, announced plans to sell its investment to private industry. At a cost of \$37,000,000, in March 1957, the Government completed an expansion program at the nickel facilities it controls at Nicaro. In previous years the Government had already invested some \$60,000,000 in Nicaro.

The rated capacity of the plant was upped to 50,000,000 pounds of nickel annually. Even before the expansion program was completed, production in 1956 reached a record output of 32,123,000 (as against 30,275,000 pounds the previous year).

The quantity of copper, chrome, and nickel exports moved upward during the first half of 1957, as compared with the same period of 1956. Iron and manganese exports were trending downward. The biggest jump was in chrome exports, which amounted to 947,531 tons (value: \$64,594) during the first five months of this year, as compared to 219,725 tons (\$15,522) during the same period of 1956.

Dominican Republic

The Dominican Republic exported minerals valued at \$2,000,000 in 1957, compared with \$1,500,000 in 1956. Iron exports total 192,000 tons of ore in 1957, compared with 144,000 tons in 1956. The country's principal minerals resources are iron, bauxite, and nickel. Plenty of salt is found; and for construction there are large deposits of gypsum, marble, granite rock, etc.

Beneficiadora Falconbridge of Canada has already blocked out about 50,000,000 tons of nickel ore, and expects to finish plant installations for start of production by 1961.

Aluminum Company of America has blocked out about 40,000,000 tons of bauxite ore and expects to go into production about October 1958. Their plans are to produce 500,000 tons of aluminum in the first year, and then to increase gradually to 900,000 tons annually.

A new foreign mining company, Hatillo, has been doing exploration work for nickel.

The government has passed a new mining code which is favorable to foreign investment.

Haiti

First shipments of bauxite ever made to the United States from Haiti were initiated on April 25, 1957 by Reynolds Haitian Mines Inc., wholly owned subsidiary of Reynolds Metals Company. One of the Reynolds fleet of self-unloading ore carriers, the "S.S. Carl Schmedeman," made the first shipment, with subsequent ones continuing through the year on that vessel and the "S.S. Louise."

Reynolds mines its ore by Marion 111-M Diesel shovels at an elevation of about 3,000 feet above sea level. The ore is transported in Dart trucks, over an eight-mile paved mountain road, to the drying plant near the shore. The drying plant consists of two Hardinge-Ruggles Coles rotary dryers, concurrently fired by means of bunker "C" oil in Dutch Oven type combustion chambers.

Dry ore is stored in a large aluminum covered shed; from here it is moved by

conveyor to the ships for loading. Almon Johnson constant tension winches load the various holds. Electric power requirements for the entire operation are supplied by three Cooper-Bessemer Diesel engines directly connected to Westinghouse generators.

Sedren S. A., the wholly owned Haitian subsidiary of Consolidated Halliwell Limited (Canada), has been actively engaged since the latter part of 1955 in the exploration and development of copper occurrences discovered on its concession of approximately 100 square miles located in the Terre Nueve district about 15 miles north of the port city of Gonaives.

Aerial photography and airborne magnetometer survey of the entire concession were completed in 1956. Following this a major portion was covered by ground magnetometer (including some self-potential) and geochemical soil sampling. Geophysical surveys were completed early in 1957. By mid-1957 prospecting crews had covered practically the entire concession area. Geological reconnaissance mapping was accomplished around the more promising exposures, particularly at the Meme, Casseus, and Bresillac zones.

Jamaica

Both bauxite and alumina production showed further increases in 1957. Bauxite exports by the two United States companies, Reynolds Jamaica Mines Ltd. and Kaiser Bauxite Company, amounted to 4,239,972 long tons of kiln-dried ore with an approximate moisture content of 14 percent, corresponding to 3,641,253 tons of absolutely dry bauxite. The alumina production was doubled and 435,752 tons of alumina were exported by Alumina Jamaica Limited in 1957 as compared with 213,321 tons in 1956. As can be seen from these figures the island has become the leading bauxite producer of the Free World, surpassing the two countries that have been the major producers, namely, British Guiana and Surinam.

Alumina Jamaica Ltd. doubled the capacity of its Kirkvine Works near Mandeville with a new addition, which came into operation in March. The Company also was engaged in the construction of a new alumina plant at Pleasant Farm near Ewarton, scheduled to be completed by the middle of 1958, with an initial capacity of about 220,000 tons. Reynolds Jamaica Mines Ltd. completed the expansion program for doubling its production, and the north-coast project of the Kaiser Bauxite Company was in its initial stages.

Two other companies, American Metal Climax, Inc. and Harvey Aluminum Company, have been granted Special Exclusive Prospecting Licenses for further prospecting for bauxite on the island and this work is now in progress. In March 1957, a new agreement was entered into between the Government of Jamaica and the three operating companies amending the original 25-year bauxite agreement and altering the existing royalty and tax rates. Under the terms of this new agreement, for a period of 25 years, the island will obtain 11s. per ton income tax plus 3s. per ton royalty, making a total of 14s. per ton. Income tax and royalties are subject to variation accord-

ing to the changes in the world price of aluminum.

Gypsum mining, carried out by Jamaica Gypsum Limited, a local subsidiary of U. S. Gypsum Company, also made further progress; the total gypsum production of the year amounted to 189,161 tons compared with 124,876 tons in 1956. Of this amount 178,986 tons of crushed gypsum rock were exported to the United States of America, the remainder being sold locally to the cement company and others.

Prospecting for iron and base metals was continued during the year in several areas, particularly in the Bellas Gate and Mavis Bank districts. New management of the Mavis Bank Iron Co. has resumed prospecting operations at Mavis Bank where, in addition to iron, copper and cobalt mineralization have been encountered.

PUERTO RICO

As in previous years the industrial minerals form the bulk of the mineral production of Puerto Rico, but prospecting for metals continued to expand during 1957. During 1956 the total mineral production was \$16,395,000, a record production for the second consecutive year and nearly \$1,500,000 higher than the record production of 1955. The 1957 mineral production was about \$20,000,000, based on preliminary estimates, an increase of approximately 22 percent.

During 1957 approximately \$200,000 was spent by private interests in exploring for iron, copper, lead, manganese, and other minerals. In addition, some \$140,000 was expended by the Commonwealth and Federal Governments for geological research. One of the most significant of the cooperative projects was the detailed drilling and sampling of a nickel-cobalt-chromite-bearing laterite near Mayaguez, in which 10,500 feet of hole were drilled and sampled by the U. S. Bureau of Mines. Another was the detailed geologic mapping of Central Puerto Rico, by the United States Geological Survey, which will lead to a complete geologic map of the Island by about 1963.

VIRGIN ISLANDS OF THE UNITED STATES

The United States Virgin Islands are composed of the three major islands of St. Thomas, St. Croix, and St. John, and a large number of smaller islets, rocks, and reefs. Crushed rock continues to be the only commercial mineral production, largely from basalt quarries operated by the Territorial government and others on St. Croix.

A program to completely map the Islands is progressing rapidly with topographic quadrangles already published of St. Thomas and nearly completed for St. John and St. Croix. Geologic mapping of St. Thomas and St. John was completed during 1957 by Princeton University. Upon final publication of this work the interpretation of the hydrothermal alteration zones and their relation to the copper prospects may become possible.

CANADA

Once again the Canadian mining industry set a new record for mineral production, with 1957 output valued at \$1,578,440,907, three percent more than in 1956. Canada continued as the world's largest producer of nickel and asbestos; second largest producer of aluminum, gold, cobalt, platinum, and zinc; and is in third place as a uranium producer. Although the value of lead, zinc, and copper decreased, expanded output of uranium and nickel more than balanced the loss. And in nearly every branch of mining, expansion and development programs continued.

British Columbia

Unfavorable Provincial legislation, coupled with worldwide problems of low metal prices and high production costs, sharply curtailed prospecting and exploration activity in British Columbia during 1957. With passage of the Mineral Act Amendment, which changes the system from Crown grants to leases, the number of claims staked in 1957 dropped 56 percent from 1956 figures.

Consolidated Mining & Smelting Company of Canada Ltd. again led production of lead and zinc, even though open-pit mining was suspended at its Sullivan mine, as were its Tulsequah operations. The nickel-copper deposit under development by Western Nickel Mines was ready to begin production at the close of the year.

Manitoba

Hudson Bay Mining & Smelting Company began production from its Birch Lake mine late in 1957, with daily production of 400 tons. Development of the company's properties in the Snow Lake area progressed on schedule, with the Chisel Lake shaft reaching the 2,000-foot level and the Stall Lake shaft sunk to more than half that depth.

Important progress was made at International Nickel Company's Mystery-Moak Lake development, where excavations were completed and building and equipment foundations well advanced. Rio Canadian Exploration, Ltd. acquired options on 668 claims in the same area.

Gunnar Mines and Strategic Materials Corporation of New York made news during 1957 with the establishment of Stranar Mines to develop large chromite properties in the Cat Lake-Bird River area.

New Brunswick

Heath Steele Mines became the province's first lead, zinc, and copper producer during 1957, while several other companies continued development and exploration. Three new base metal deposits were discovered: Anaconda Company of Canada reported two in the Armstrong Brook and Rocky Turn area, and other was reported by Captain Mines Ltd. near the Brunswick No. 6 ore body.

Northwest Territories

Gold and uranium were of major importance in mineral development during 1957. Rayrock Mines Ltd.'s uranium mine and mill began production, and in the region of the East Arm of Great Slave

Lake, uranium indications caused a rush to file claims.

Large lead-zinc deposits were reported on the shore of Great Slave Lake, and similar deposits were discovered at Indian Mountain Lake. In the Coppermine area, geophysical and geological work has been underway by several companies, involving 30,000 feet of diamond drilling during the past year.

Ontario

Although mining activity has leveled off to a more normal routine, the Blind River district continued to be in the spotlight during 1957. By the end of the year, five companies (Northspan, Consolidated Denison, Can-Met, Algoma, and Pronto) had begun production from six of the 11 mines in the district, and three others are expected to begin operations during 1958. At this time, total reserves of the area are reported at 250,000,000 tons of ore, valued at \$3,000,000,000.

In the Bancroft area, three companies, operating two mills, are now in production and a fourth is expected to begin production during the first half of 1958.

Nickel production reached a new high, and International Nickel Company of Canada Ltd. and Falconbridge Nickel Mines Ltd. continued expansion and further development of deposits in the Sudbury Basin.

Quebec

A new record for asbestos production was set in 1957 in the Eastern Townships, with slightly more than 1,000,000 tons produced. Because of the growing market and the large reserves, asbestos producers continued to expand operations and Carey-Canadian Mines, National Asbestos Mines, and American Smelting and Re-

fining Company's subsidiary, Lake Asbestos of Quebec, will begin production within the year.

Iron production also increased during 1957, and further development is planned by the newly established Ungave Iron Ore Company and the Quebec Cartier Mining Company.

Saskatchewan

Potash deposits were the center of mining activity during 1957. Potash Company of America's shaft reached the 2,500-foot level, with less than 1,000 feet remaining to complete the project. Installation of a recovery plant neared completion and the plant is expected to begin operations by the end of 1958. International Minerals & Chemical Corporation continued its program of shaft sinking and began construction of a recovery plant. Columbia Metals Exploration Company, Ltd. entered the potash field with exploratory drilling near Atwater.

Uranium was also in the limelight with Eldorado Mining and Refining Company and Gunnar Mines leading in production. Lorado Uranium Mines' custom mill was completed and began treating ores from several small, high-grade mines in the area.

Yukon

Cassair Asbestos Corporation Ltd. reported substantial asbestos findings on its Caley, Clinton Creek, and Letain properties, leased from Conwest Exploration Ltd. Continued exploration and development slightly increased ore reserves of United Keno Hill Mines Ltd. in the Mayo district, and several other companies have undertaken exploration in neighboring areas.

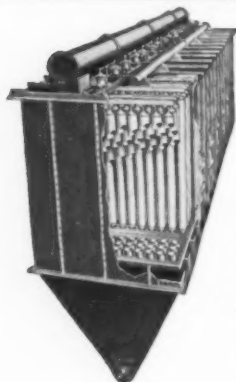
Metal Production and Values in Canada as Tabulated by the Dominion Bureau of Statistics For 1955, 1956, and 1957

Metal	1955		1956		1957 ¹	
	Quantity	Value	Quantity	Value	Quantity	Value
Antimony ²	2,021,726	\$ 563,345	1,820,000	\$ 576,300	1,411,000	\$ 353,697
Asbestos ⁴					1,061,419	106,395,200
Barite ⁴					216,325	2,461,538
Bismuth ²	265,896	572,362	273,007	494,157	276,791	536,599
Cadmium ²	1,919,081	3,262,439	2,258,184	3,838,913	2,340,015	3,978,025
Cobalt ²	3,318,637	8,563,700	3,685,956	9,372,670	3,736,178	8,081,226
Copper ²	651,987,423	239,756,455	706,585,547	291,469,615	692,053,656	199,543,377
Fluorspar ⁴					68,463	1,798,308
Gold ³	4,541,062	156,788,528	4,378,862	150,808,010	4,436,101	148,786,827
Indium ³	104,774	232,598	805,500	358,000	385,000	847,000
Iron Ore ⁴	16,283,177	110,435,850	22,526,311	156,327,885	22,386,993	155,549,111
Iron Ingots ⁴	115,955	4,831,845	157,000	6,339,000	186,700	6,148,000
Lead ²	405,525,038	58,314,500	373,349,551	57,906,514	375,819,451	52,464,395
Magnesium and Calcium ²		6,585,409		5,617,826	16,259,808	5,353,245
Molybdenum ²	1,389,177	823,954	1,452,028	967,461	874,600	1,145,726
Nickel ²	349,856,992	215,866,007	355,986,460	223,343,992	376,265,731	261,253,209
Palladium, Iridium, Rhodium, Ruthenium, etc. ³	214,252	8,321,633	161,600	6,495,065	213,285	7,726,930
Platinum ³	170,494	14,747,732	150,000	15,585,000	196,077	17,490,000
Selenium ²	427,109	3,203,319	508,000	8,858,000	352,871	3,765,500
Silver ²	27,984,204	24,676,472	28,794,573	25,831,612	30,138,447	26,319,907
Tellurium ²	9,014	15,774	24,000	42,000	34,503	63,981
Tin ²	492,781	408,030	611,000	521,550	809,000	764,505
Titanium ⁴	1,464	10,634	4,443	37,100	10,485	54,638
Tungsten Concentrates (WOC) ²	1,942,770	5,508,437	2,206,662	6,060,992	1,992,840	5,579,952
Uranium ²		26,031,604		39,577,000	12,875,799	130,911,234
Zinc ²	866,714,038	118,306,466	847,239,825	125,476,218	824,617,875	99,696,301
Total Value		\$1,007,827,093		\$1,136,352,380		\$1,247,066,431

1. Preliminary estimate 2. Pounds 3. Ounces 4. Tons

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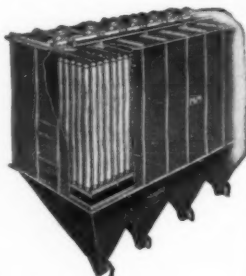
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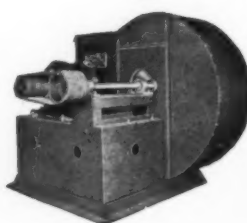


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OCEANIA

AUSTRALIA

Production of most metals increased slightly in 1957. Expanded output of rutile and zircon was very marked compared with the previous record figures established in 1956. Due to the year end collapse in spot prices for these minerals, 1957 production records will not be maintained in 1958, although capacity will be available to take advantage of any resurgence in demand.

The exuberance of the mining community following discoveries of enormous bauxite deposits over a year ago has been dampened by general declines in metal prices. 1957 ended darkly and 1958 began on an even more somber note with announcements from the great Broken Hill lead-zinc producers: first, that zinc concentrate shipments had been suspended and, later, that working time would be reduced by 10 percent.

QUEENSLAND

The Cape York Peninsula bauxite deposits are now regarded by some authorities as the world's largest. A special act of the Queensland parliament has encouraged establishment of an aluminum industry while ensuring that large expenditures will be undertaken by Commonwealth Aluminum Corporation Pty. Ltd., a subsidiary of Consolidated Zinc Pty. Ltd. In addition to "comalco," Aluminum Laboratories Ltd., a subsidiary of the Aluminum Corporation of Canada, is prospecting bauxite areas on the Peninsula. Aluminum Laboratories Ltd., Reynolds Pacific Mines Pty. Ltd. and Rio Tinto Australia Exploration Pty. Ltd. are also prospecting for bauxite in the Northern Territory.

Mount Isa Mines Ltd. vigorously pursued its development and expansion programs. Large additions were made to both copper and lead-zinc ore reserves. Further large increases are expected during the 1958 year. Construction of the copper refinery at Townsville is well advanced and production is expected to commence in mid-1959. Plans for an increase in ore production from 4,000 to 13,000 tons per day are dependent upon rehabilitation of the Mount Isa-Townsville railway. This is under consideration by the Queensland and Federal governments. Meanwhile production is to be stepped up to 6,000 tons of ore per day in April 1958, increasing to 7,000 tons per day in December 1959.

Mount Morgan Ltd., copper and gold producer, expressed concern at the trend of copper prices and a reduction in pyrite sales. Stabilization of copper price and an improvement in demand for pyrite are both necessary to put the mine on a satisfactory basis.

Mary Kathleen uranium mine is expected to commence producing uranium oxide within a year. Construction recently has been ahead of schedule.

NEW SOUTH WALES

Rutile and zircon producers on the north coast of this state and the south coast of Queensland produced record tonnages of minerals from beach and dune deposits. Most companies were forced to curtail production and several of the newcomers to this field of mining suspended operations by year's end, due to the virtual disappearance of the market for spot mineral sales.

VICTORIA

Gold mining on a small scale continued, largely as a result of the Federal government subsidy. Some work was done on the investigation of iron deposits at Nowa Nowa but prospects of finding iron ore reserves appear brighter in several other states of the Commonwealth.

TASMANIA

Deposits of iron ore in the west coast district, at Savage River, Rocky River, and Long Plains were explored. These are believed to be very large. A subsidiary company of Rio Tinto Ltd. was interested in possible development of the area.

The joint exploration program of The Mount Lyell Mining and Railway Co. Ltd. with The Electrolytic Zinc Co. of Australasia Ltd. continued in selected areas of the southwest coast.

King Island Scheelite Ltd., King Island, produced 1,437 tons of concentrates in its financial year ended October 1957. This was almost 100 tons below the record output of the previous year. The contract with the United State government expires in April 1958, after which concentrates must be sold on the open market. Working time has been reduced from seven days per week to five.

Refined zinc output by The Electrolytic Zinc Co. Ltd. was 105,000 tons. The company continues to obtain most of its concentrate from its own mines at Rosebery.

The Mount Lyell Mining and Railway Co. Ltd. had some success in its expansion program. Copper output was at a rate of 10,000 tons per year, all of which was sold on the local market. A new ore body was reported at Mount Lyell and its potential is being investigated. Drill hole results have been erratic, with some very high values.

SOUTH AUSTRALIA

Late in 1957, The Broken Hill Proprietary Co. Ltd. reopened the Iron Baron hematite deposit, near Whyalla. This is a low-manganese ore body worked on a small scale from 1933 to 1941. The ore will augment supplies to the expanding blast furnace requirements at Port Kembla, N.S.W.

The State Mines Department intensified its prospecting and testing work on iron ore deposits in the Middleback Ranges.

Southwestern Mining Ltd., in which Nickel Mines of Australia and Southern Mining and Development Co. Ltd. have equal shares, continued geological and geophysical surveys and related work at Mount Davies.

The Broken Hill Associated Smelters Pty. Ltd. will install a blast furnace for zinc production similar to that reported by Consolidated Zinc Pty. Ltd. for installation at Cockle Creek, N.S.W. No date has been set down for commencement of the project which, presumably, may be delayed by the present depressed state of the zinc industry generally.

WESTERN AUSTRALIA

Iron ore shipped from Cockatoo Island to two N.S.W. steelworks was at the rate of 430,000 tons per year (compared with 3,000,000 tons from Whyalla, S.A.). The Western Australian State Government twice applied to the Federal Government for a license to export iron ore to Japan. The proposal was disallowed by the Commonwealth on the grounds that iron ore reserves are inadequate.

Gold continues as Western Australia's major metal. 80 percent of Australia's gold comes from this state. The Commonwealth gold subsidy has, undoubtedly, been responsible for maintaining output at the current level and there does not appear to be prospects of any significant increase unless deep drilling for a repetition of Kalgoorlie's "Golden Mile" is successful. Exploration is continuing.

Regular shipments of ilmenite were made from the port of Bunbury to Australian and overseas consumers. There appears a grave danger of oversupply in the ilmenite market, as there is in the case of rutile. The intention of Westralian Oil Ltd. to produce 100,000 tons of ilmenite per year will only aggravate the situation.

Production of copper concentrates on a small scale commenced at Ravens-thorpe.

NORTHERN TERRITORY

Atlas Corporation of New York, New York, abandoned its interest in one of the glamorous companies of the uranium boom—North Australian Uranium Corporation N.L. What remains of the Atlas interests has been purchased by Aberfoyle Tin N.L., of Tasmania. National Lead Company, also of New York, ceased all work on the leases of New Merloo Gold Mines N.L. at Tennant Creek and gave notice of termination of the agreement between the two companies. Northern Hercules N.L., Pine Creek, after further losses, sold its plant and leases to United Uranium N.L. United Uranium, the successful South Alligator River uranium producer, will convert the plant for production of uranium oxide. Although United Uranium's ore reserves are not yet large, the ore body is comparatively rich and should develop fa-

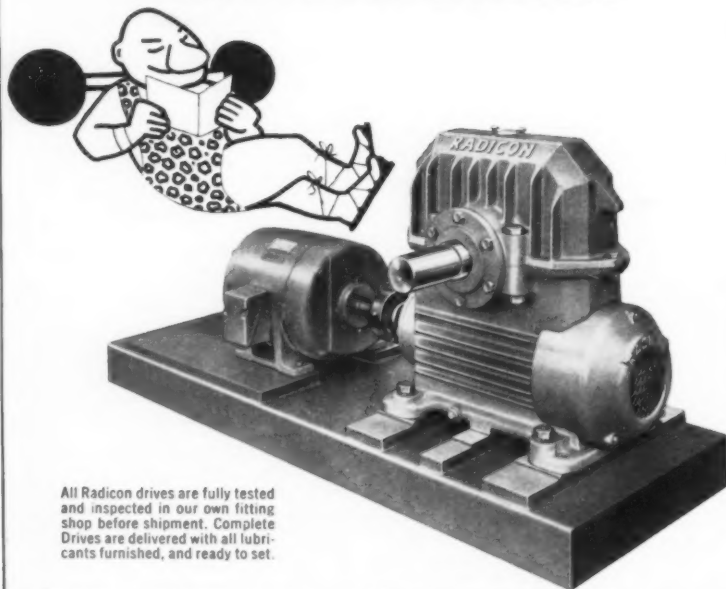
Australian Mine Production of Metals From 1952 Through 1957

Metal	1952	1953	1954	1955	1956	1957 ¹
Gold ²	980,400	1,075,200	1,117,742	1,049,039	1,029,821	1,078,000
Silver ²	11,278,400	12,539,200	13,827,038	14,555,412	14,586,197	15,000,000
Copper ²	18,578	36,585	41,256	46,165	53,706	56,000
Lead ²	228,196	269,344	284,862	295,944	299,485	305,000
Zinc	196,450	239,324	252,659	256,564	278,082	290,000
Tungsten ³ , WO ₃ Content	1,282	1,116	1,100	1,170	1,220	1,200
Tin ³	1,611	1,553	2,075	2,017	2,078	2,100
Rutile concentrates ³	38,861	38,039	44,659	59,613	96,327	130,000
Zircon concentrates ³	N.A.	27,207	41,453	48,683	72,458	90,000
Iron ore ³	N.A.	3,298,718	3,518,804	3,572,609	3,923,985	4,000,000
Sulphur ³ , 4	N.A.	N.A.	N.A.	N.A.	N.A.	235,100

1. Estimated. 2. Fine ounces. 3. Long tons. 4. Recoverable sulphur content of zinc, lead, and pyrite concentrates.

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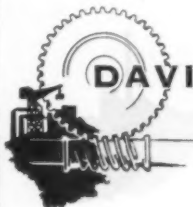
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Oceania

vorably. Nearby, the property of South Alligator Uranium N.L. continues to open up satisfactorily.

In conjunction with King Island Scheelite N.L. and Loloma (Fiji) Gold Mines N.L., United Uranium is exploring the Maranboy tinfield. The field had been worked previously to shallow depths only. Intersections of ore so far made are most encouraging.

Peko Mines N.L., Tennant Creek copper-gold producer, completed an expansion program. It now has capacity to produce 9,000 tons of copper per year in concentrate form but will limit production to what can be disposed of on the Australian market pending an improvement in metal prices overseas. It appears that the mine will only work at about half capacity in the meantime.

FIJI

During 1957 Fiji mining depended on the gold production from the Emperor Gold Mining Company Limited's group in the Vatukoula field and on manganese produced by syndicates from several small but relatively high-grade open-cut deposits, chiefly from the Nadi-Sigatoka area of southwestern Viti Levu.

A revival of interest in several small copper deposits subsided with the fall in metal prices and no export production resulted, the small development output being stockpiled. One such deposit on Vanua Levu is reported to show signs of radio activity.

Aluminum Laboratories Ltd. commenced a search for commercial bauxite deposits at several points throughout the group but no finds have been announced.

In the Vatukoula goldfield the most significant feature was the evidence of a continuation of the deposits to the eastward, and development has proved the main flatmake system to be passing into the "mudstone" basin at depth. This basin was formerly believed to contain an unfavorable column of sedimentary pyroclastics, but drilling has shown it to consist largely of andesitic flows inter-layered with relatively small amounts of ash and similar materials. This explains the gold and tellurides found by drilling and alters the prospects.

Development in progress on No. 15 level of the Emperor property is designed to open the favorable area disclosed by drilling but early in 1958 was suspended until heavy bulkheads and pumps have been installed against the high pressure water known to exist in the undrained "basin."

The Fijian Colonial Government has agreed to waive taxation and royalty payments by the Emperor group in return for the heavy expenditure being made on the search by the group.

Gold Ore Mined and Milled in Long Tons, Ounces of Gold and Silver Recovered, and Long Tons of Manganese Mined in Fiji in 1956 and 1957

Item	1956	1957
Gold-Silver		
Mined, tons	164,819	181,334
Milled, tons	165,987	208,507
Gold, fine ounces	67,282	78,807
Silver, fine ounces	24,080	25,278
Manganese		
High-grade, 48-60% Mn	18,262	20,698
Low-grade, 35-48%	0	6,766

INDONESIA

Tin production in Indonesia declined for the fourth straight year to 27,725 long tons. In 1956 it was 30,053, in 1955 33,368, and an all time high of 35,861 in 1954. Once again production from Banka (17,292) was greater than the combined output from Billiton and Singkep (10,431).

Value of tin exports in 1957, according to the preliminary data from the Central Office of Statistics, was Rupees 619,000,000, compared with Rupees 707,000,000 in 1956 and Rupees 678,000,000 in 1955.

The Tambang Mas Tjikotok gold operations in southern Banten, West Java, went into production on a trial basis in August. Until the middle of December about 40 kilograms of gold had been produced from the Tjirotan mine. The Tjikotok mine did not get underway during the year. The government bought 25 percent of the production at the official price of gold, Rupees 12.465 per kilogram. The other 75 percent was sold on the free market for at least Rupees 60,000 per kilogram. About 1,000 kilograms of silver were also mined which sold on the free market for Rupees 720 per kilogram. Both mines should be operating in 1958.

The Bank Industri Negara bought out the only gold-silver smelter and refiner in Indonesia, N. V. Essaijer & Affinagebedrijf v/h Braakensiek in Djakarta, from the British owned, A. Gutwirth. This plant processes the Tjikotok output.

The government-owned asphalt mine at Buton, being developed by the Buton Asphalt Company, was producing at a rate of about 40 tons per day during the year.

Discoveries of manganese and iron ore were both reported in West Java.

Indonesia Tin Production in Long Tons by Months and Sources in 1957

Month	Banka	Billiton and Singkep	Total
Jan.	1,104	884	1,988
Feb.	952	840	1,792
Mar.	1,205	822	2,027
Apr.	1,195	677	1,872
May	1,368	711	2,079
June	1,566	745	2,311
July	1,666	739	2,405
Aug.	1,726	852	2,578
Sept.	1,846	1,040	2,886
Oct.	1,808	1,211	3,019
Nov.	1,570	1,062	2,632
Dec.	1,286	848	2,134
Jan.			
Dec.	17,292	10,431	27,725

NEW CALEDONIA

The nickel companies have expanded production to meet greater demands. The ore target was 1,800,000 annual metric tons and was not reached. It will be lower in 1958 than in 1956. Exports to Japan increased to 1,100,000 tons from 770,000 in 1956. Exports for 1958 will be about 500,000 tons.

The electric furnace plant at Yaté is expanding to 20,000 annual tons (matte plus ferronickel) in 1960. In 1957 output was 10,300, up from 9,600 in 1956. 12,000 to 13,000 tons are planned for 1958.

Chromite production increased to 63,000 tons from 49,000 in 1956. Output of 60,000 is to be maintained in 1958.

NEW GUINEA

Gold dredging and sluicing are the most important mineral producing activities but it appears that reserves will soon be exhausted. Bulolo Gold Dredging Ltd. operated only dredge No. 4 at year end, No. 5 having been closed down permanently in May. Remaining gravel reserves amount to approximately 19,000,000 cubic yards of which half is suitable for dredging and half for sluicing.

In the year ended 31st May, Bulolo Gold produced 51,693 ounces of gold and 20,597 ounces of silver from 8,211,000 cubic yards. In the following six months, 17,315 ounces of gold were recovered from 3,075,000 yards. The only other producer of note is New Guinea Goldfields Ltd. with an output of about 1,000 ounces per month. Total New Guinea gold output in 1957 is estimated at 55,000 ounces.

Consolidated Zinc Pty. Ltd. commenced an investigation of the Astrolabe copper field near Port Moresby.

Some interest was taken in possible nickel-bearing deposits but nothing of economic size was discovered.

The Administration is attempting to encourage prospecting. It has brought into operation an ordinance providing loan assistance for the investigation of mineral deposits. Recent amendments to mining ordinances provide for special prospecting grants of areas of up to 1,000 square miles and exclusive prospecting licenses for areas of up to 25 square miles.

NEW ZEALAND

Estimated 1957 gold output is 30,000 ounces. Prospects for 1958 are that about the same quantity will be produced. Three dredges operated at Alexandra, Ararua, and Taramakau. These account for 90 percent of gold production. The leading producer was Kaniere Gold Dredging Ltd. at Taramakau. Monthly returns were from 1,000 to 1,300 ounces of gold obtained by treating 320,000 to 400,000 cubic yards of gravel. New Zealand dredging costs are claimed to be the world's lowest at under sixpence (Stg.) per cubic yard.

Lime and Marble Ltd. continued prospecting for uranium on the north side of the Buller River. The area is precipitous, covered with dense vegetation, and has a high rainfall, so that prospecting is both arduous and difficult. Float boulders containing radioactive material were found in creek beds and have been traced to their source. Prospecting has been confined to what appears to be the most persistent and richest horizon located. A

helicopter has been used in the work and an access track is under construction.

Proposals to develop vast deposits of iron sands have been taken a stage further with the formation of a local company which aims to attract large-scale capital from overseas. Negotiations have taken place with British interest and German interest was also reported. Two Australian companies have reportedly been approached. The "Taranaki iron sand" (titanomagnetite) of the North Island is estimated to contain over 700,000,000 tons approximating to the composition: Fe 60 percent and Ti 6 percent. Ilmenitic beach sands of the South Island's Westland are estimated to total nearly 1,000,000 tons averaging Fe 33 percent and TiO₂ 27 percent. Since great power developments are taking place in New Zealand, especially in the South Island where one scheme alone—Benmore—will cost £38,000,000 and ultimately produce 480,000 kilowatts, a smelting project may succeed if capital can be attracted on a grand scale.

REPUBLIC OF THE PHILIPPINES

The year 1957 witnessed continued progress in the Philippine mining industry, but the rate of increase in production value slowed considerably as a result of the drop in mineral prices.

Gold production decreased, but copper for the second consecutive year was number one mineral product in value of output with an all-time tonnage peak.

Chromite remained the brightest spot in the mining industry although there was a weakening demand during the last half of 1957.

Iron ore output was a little lower, but there is an encouraging outlook in the industry. Iron mining and beneficiation in the Philippines is undergoing a transition in technology, although still on a small scale, in line with modern operations in other countries.

There was a larger but sporadic production in manganese, and a further increase in output of mercury to an all-time high.

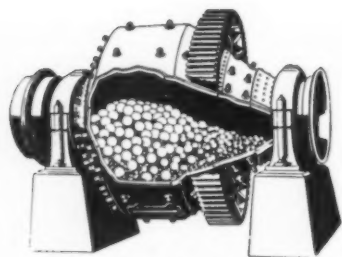
Gold output was 379,982 ounces from 10 mines in 1957, compared with 406,163 ounces from 12 mines in 1956.

There was a small gain of two percent in value of production due to higher prices which, in turn, resulted from active buying by holders of "blocked pesos," who pay for the gold in pesos and receive \$35.00 per ounce from the Central Bank. As a result of this buying, the price in the Manila market reached as high as 127 pesos (\$63.50 at official rate of ex-

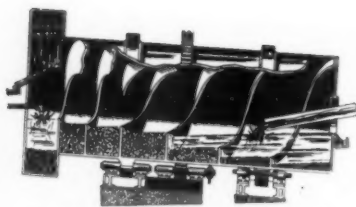
Production of Metals and Ores in the Philippine Islands for the Years 1951, 1952, 1953, 1954, 1955, 1956, and 1957

Commodity	1951	1952	1953	1954	1955	1956	1957 ¹
Gold ²	393,602	469,408	480,625	416,052	419,112	406,163	379,982
Silver ²	274,602	693,751	572,046	502,069	N.A.	541,168	479,216
Chromite ³							
Metallurgical	32,736	52,364	88,541	62,595	59,745	127,370	113,358
Refractory	301,835	491,150	468,549	388,590	535,262	581,685	612,158
Iron ore ³	903,282	1,170,133	1,217,864	1,424,898	1,432,712	1,440,232	1,346,363
Copper ³	12,712	13,264	12,715	14,349	17,461	26,963	40,382
Manganese ore ³	22,343	20,627	21,508	9,393	11,912	4,414	30,231
Lead ³	571	2,300	2,434	1,827	2,318	2,140	814
Zinc ³	155	1,596	747	—	—	950	302
Mercury ⁴	—	—	—	—	635	3,015	3,363

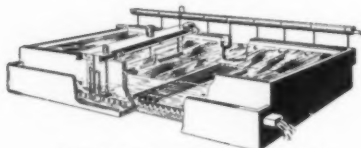
1. Estimated. 2. Fine ounces. 3. Metric tons. 4. Flasks (76 pounds).



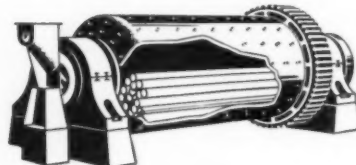
CONICAL MILLS



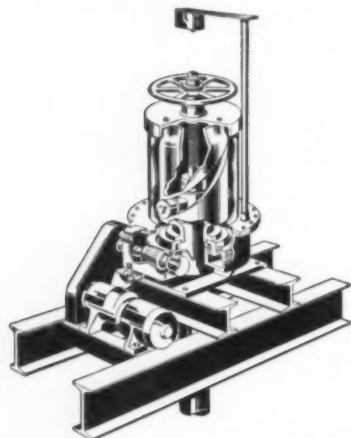
COUNTER-CURRENT CLASSIFIERS
HEAVY-MEDIA SEPARATORS



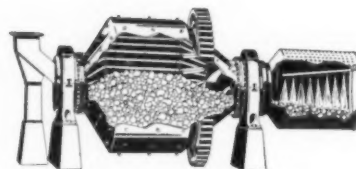
AUTOMATIC BACKWASH SAND
FILTERS



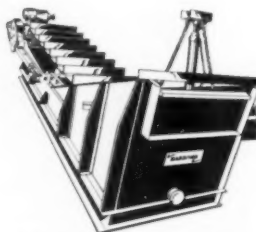
ROD MILLS



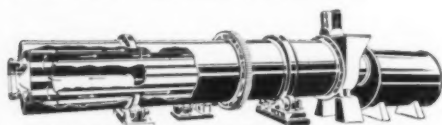
"AUTO-RAISE" THICKENER MECHANISMS



CONICAL ORE SCRUBBERS



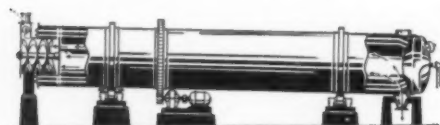
OVERDRAIN CLASSIFIERS



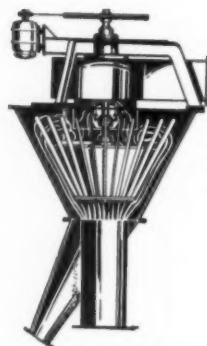
DOUBLE-SHELL, SEMI-DIRECT COAL DRYERS



HORIZONTAL ROTARY KILNS



STEAM-TUBE ROTARY DRYERS



"GYROTOR"
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change) during the year, with the annual average at 120.24 pesos, compared with the average of 109.76 pesos in 1956.

One small mine, Benquet Exploration, Inc., went into production in September with a mill of 50 tons a day. While the mine contains high-grade ore which enables the company to show profit from operations, the managers, Phillex Mining Corporation, have no plan now to increase the mill capacity beyond 50 tons to keep down overhead.

The combined production of the two biggest mines, Benquet Consolidated, Inc. and Balatoc Mining Company, which are under one management, again accounted for more than 50 percent of total gold production in 1957. Benquet Consolidated, produced 116,478 ounces, compared with the 1956 production of 119,805 ounces. Balatoc Mining increased production to 102,622 ounces from the previous 96,480 ounces.

Baguio Gold Mining Company is developing more ore at the property of Gold River Mining Company which was acquired in 1957 through merger of the two companies. Production dropped to 29,370 ounces from the 1956 total of 31,468 ounces.

Itoyon-Suyoc Mines, Inc., was treating 650 tons of ore a day at the company's Itoyon mine, where increase in milling capacity was completed in October from 500 tons. Production increased to 31,505 ounces from 28,774 ounces reported in 1956. The company is rushing the installation of the new 300-ton mill at the prewar Suyoc mine and work to reopen the underground workings is in progress. Reopening of the 9,400-foot Palidan deep level tunnel was completed in December. The tunnel has been timbered and is now being used as a drainage for the Suyoc mine. Tracks have also been laid on one side of the tunnel for ore cars for transporting ore from the mine to the new mill which is scheduled to be completed during the third quarter of 1958.

Copper production continued to increase to an all-time peak, but the value was a shade lower than in 1956 due to the decline in prices. Total production was 40,382 metric tons.

The increase in quantity was contributed principally by the Toledo mine of Atlas Consolidated Mining and Development Corporation, whose mill treated 12,000 tons of ore a day. The gradual increase in capacity was finally completed in 1957 from the original capacity of 4,000 tons when the mill started operation in 1955. Atlas produced a total of 17,273 metric tons of copper.

The company concluded last year an agreement with the Newmont Mining Corporation of New York, New York whereby Newmont would undertake at its own expense to develop ore reserves at the Toledo mine. In addition, Newmont will undertake exploration work, also at its own expense, in areas outside the Toledo mine, and if it develops not less than 5,000,000 tons of proven copper ore suitable for open-pit mining operations, it will receive as compensation 12,500 shares of Atlas stock for every 100,000 tons of proven ore.

One new copper mine, Sipalay, on Negros island, went into production in May with a mill of 4,000-ton daily capacity. This is the second mining operation of low-grade disseminated copper ore in the Philippines, the first one being the Toledo mine of Atlas Consolidated. Production during eight months of op-

Oceania

eration amounted to 2,281 metric tons of copper. Marinduque Iron Mines Agents, Inc., owners of the mine, has plans to increase the mill capacity to 6,000 tons.

Marinduque also owns the Bagacay copper mine on Samar Island, and is mining and shipping high-grade ore to Japan. Production showed an increase to 5,364 metric tons of copper from 42,085 tons of ore shipped during 1957, compared with 2,103 tons of copper from 15,269 tons of ore shipped in 1956. It is also the plan of the company to erect a concentrating plant on this property as soon as sufficient ore reserves are developed.

Lepanto Consolidated Mining Company produced an estimated 12,991 metric tons of copper compared with 11,667 tons in 1956. Gold production was 45,326 ounces, 43,798 in 1956.

Mindanao Mother Lode Mines, Inc., operating the Cabapa copper mine, increased production by 60 percent to 2,222 tons of copper compared with 1,385 tons in 1956.

The Santo Tomas copper project of Philex Mining Corporation is scheduled to start production early in June with a 2,000-ton mill being rushed to completion at year's end. The mill has been designed to treat eventually 3,000 tons of ore a day and the mine has possibilities to become one of the country's major copper operations in the future.

Consolidated Mines, Inc., whose property is operated by Benguet Consolidated, Inc., accounted for the country's total exports of refractory chromite except for a trial shipment of 895 tons made by a small mine.

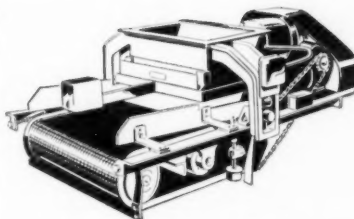
Acoje Mining Company, biggest producer of metallurgical chromite, showed a drop in shipments during 1957 to 96,158 metric tons compared with the previous year's total of 113,957.

Mati iron mine, operated by Atlas Consolidated, showed increased output of 163,374 metric tons, compared with the previous total of 94,328 tons. Further increase in production should be recorded in 1958 as the operators are installing additional mine machinery and equipment to increase ore reserves.

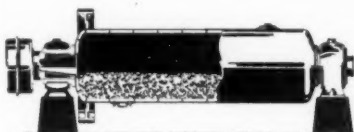
Philippine Iron Mines, Inc. shipped a total of 1,019,906 tons during 1957, compared with 1,045,851 tons in 1956. It is expected that production during 1958 will increase with the completion of the 6,000-ton beneficiation plant.

There was a revived activity in manganese mining due to barter trade allowed under Republic Act No. 1410, and except for some 5,000 tons of high-grade ore shipped to the United States, all shipments were reportedly made to Japan under barter trade. Production reached the highest record since 1950 at 30,231 tons. There were eight mines in operation but production was sporadic and not one company was able to make regular monthly shipments.

There is still only one mercury mine in the Philippines but it is now considered as one of the world's important quicksilver mines. Two or three companies were exploring quicksilver deposits but have not disclosed any plans for future operations. Palawan Quicksilver Mines, Inc., increased production during 1957 to an estimated 3,363 flasks. The company is installing another Gould rotary kiln, the third unit at its present plant on Palawan island, which will further increase production during 1958.



CONSTANT-WEIGHT FEEDERS



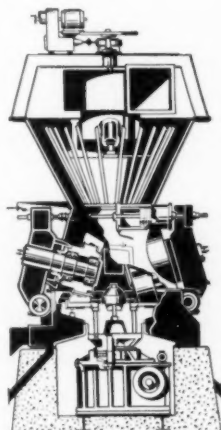
BALL AND PEBBLE TUBE MILLS



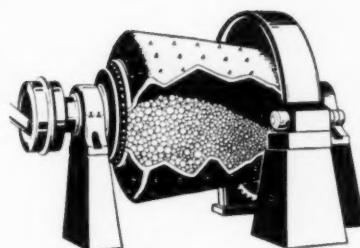
HYDRO-CLASSIFIERS



CASCADE MILLS



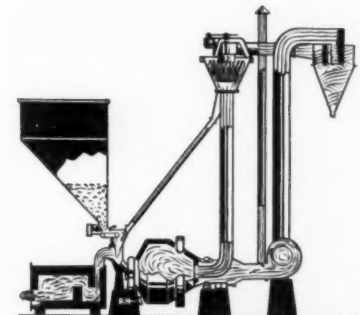
DISC-ROLL MILLS



TRICONE MILLS



CENTER-PIER CLARIFIERS AND THICKENERS



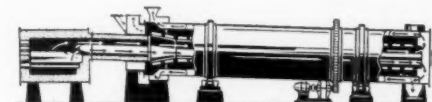
"GYROTOR" AIR CLASSIFYING SYSTEMS



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LATIN AMERICA

ARGENTINA

During 1957, the new national policy of recovery and economic improvement influenced all departments of the government. On May 1, 1958 this provisional government will be replaced by constitutional authorities. Among the achievements of the provisional government were the creation of an autonomous Banco Industrial whose capital was increased to \$3,000,000 (in the future it will develop as an economic bank with a particularly strong mining division), and the revival of the railway system which is so vital to development of the Argentina mining districts.

Exploration for and mining of tungsten increased during the past year. National output was about 2,000 tons, making Argentina second largest tungsten producer in South America. About 90 percent of the production came from San Luis Province with the Arrequin company now operating its new flotation plant.

Exploration and investigation of the Sierra Grande hematite and magnetite ores in Rio Negro province were carried out successfully during the year. It is believed that at least 100,000,000 tons of high-grade iron ore exist in the area.

National Lead Company, the country's largest lead producer, completed the differential flotation plant at Castano Viejo, San Juan province. It now produces concentrate containing 600 tons of lead and 700 tons of zinc monthly for Argentina's use.

Mining of copper was resumed at Cerro Famatina, La Rioja province, but the outlook for this operation is discouraging because of government regulations which will permit larger imports.

BOLIVIA

The Bolivian government's mining agency, Corporación Minera de Bolivia, found the status of many of its mines steadily declining by the end of 1957. Several mines had suffered heavy losses. Improper legislation and mismanagement have been the principal causes. Tin exports declined for the fourth straight year - 26,600 tons. In 1956, 27,336 tons.

A serious effort is now being made to pull these operations "out of the red." Acting on some of the recommendations made in the report of the United States firm of Ford, Bacon & Davis, consulting engineers, the government had decided at year's end to close some of the so-called marginal mines which were working at a loss. The workers were being sent back to agricultural districts from which they came if they could not be placed in other privately operated mines. A special commission of Ford, Bacon & Davis was studying the possibilities of re-equipping the Catavi, Colquiri, and Huanuni tin mines and improving the financial status of the three units.

There were some bright sides to the Bolivian mining situation, however. National Lead Company finally obtained an option on the Matilda zinc mine, which belonged to the Mauricio Hochschild group before its nationalization. The Matilda is actually a collection of various mining enterprises and accessory plants in the districts of Timusi, Ancoraimes, and Carabuco. Abundant deposits of zinc,

lead, copper, silver, and gold have been found in the area.

Ventures Ltd. and Vitro Corporation America reached an agreement in principle with the Bolivian government for large-scale minerals exploration in the Andes Mountain. A joint company, called Bolivex Exploration Company, was set up to carry out a two-year program at a cost of about \$200,000.

The German firm of Krupps made smelting tests on Bolivian tin ores. Tests with the Waelz volatilization procedure appeared to be encouraging, making a high-grade dust from very low-grade concentrates. Placer Development Ltd. also expressed an interest in Bolivian tin. The firm reportedly approached the government for permission to erect a tin concentrator which would treat the dumps at Catavi.

W. R. Grace & Company continued its operation of the Chojilla tungsten mine and the Tanapaca tin mine. In the latter they discovered good ore and monthly tin production increased five-fold during the year. Through the International Mining Company which it controls, Grace also took an option on the Ocuri property, originally Chilean owned, and will sample the gold placer again. The firm appointed a consulting engineer during the year who will supervise mineral activities in Peru, Chile, and Bolivia.

BRAZIL

Brazilian mineral production and the metallurgical industry were of great importance to the country in 1957. The government was highly interested in expanding the capacity of the existing steel plants to increase steel production from 1,000,000 tons to 2,000,000 tons by 1960. Two new steel companies, COSIPA and USIMINAS, had substantial help from the government. Cosipa had a loan of 2,000,000,000 cruzeiros, and Usiminas received 3,200,000,000 cruzeiros. Usiminas group will be financed by Japanese capitalists (40 percent). Both will enlarge steel production by 900,000 metric tons. Cosipa will be built in Piassaguera, close to Santos, State of São Paulo, and Usiminas will build its steel plant at Acesita, Rio Doce valley, State of Minas Gerais.

Volta Redonda, in the near future, possibly in 1960, will be able to enlarge its production to 1,000,000 tons (ingots). To do it Volta Redonda received \$35,000,000 from the Export-Import Bank in 1956, its fourth financing help. With this sum the Bank has contributed \$105,000,000 to Volta Redonda.

The Cia. Ferro e Aço de Vitória, State of Espírito Santo, another steel plant, was expanded in 1957 and will be producing 100,000 tons.

To meet estimated aluminum consumption in 1960 of about 46,000 tons, in 1957 the two existing plants started a program to enlarge their output. The Elqueira plant, Ouro Preto, State of Minas Gerais, will be able to produce 8,800 tons in 1958, however, there is a new plan to increase the production to 15,000 tons. The Companhia Brasileira de Alumínio, located at Aluminio, State of São Paulo, is already producing 10,000 metric tons and is preparing to increase it in 1960.

According to present plans, Brazilian aluminum production in 1960 will be 18,800 tons; by 1962, Brazilian production will reach 42,000 tons. New projects con-

cerning the aluminum industry are being considered. One of them will be established in the Paulo Afonso region; the other in Poços de Caldas region, where the most important bauxite deposits of Brazil are situated.

Brazilian exports of manganese ore were considerably increased in 1957. Tonnage over the past seven years shows this fluctuation: 1950 143,000 tons; 1951 121,000 tons; 1952 163,000; 1953 168,000; 1954 97,600; 1955 168,000; 1956 205,000; 1957 690,000 tons.

BRITISH GUIANA

The most significant fact about last year's activities in the mining industry is that definite steps have now been taken to develop the manganese deposits in the northwestern part of the territory. Two companies are preparing for production: African Manganese Co. (Mines Management) Ltd. plans to install three crushing and washing plants with a capacity of 30,000 tons of manganese concentrate a month, and North-Western Guiana Mining Co. Ltd. (a subsidiary of the Union Carbide and Carbon Corporation) is erecting a plant capable of producing 30,000 tons a month by 1961. A 38-mile railroad will also be constructed so that the ore can be transported to the point of shipment. Work has also been started on constructing a ship turning basin and loading station at Sebai Kaituma River and a railroad from there to the mine at Matthews Ridge.

Bauxite production by the two major companies operating in the Colony was adversely affected by a strike at the Arvida smelter which forced the reorganization of storage facilities at Chaguanas which, in turn, caused a slowing down of mining.

Demerara Bauxite Company acquired the properties of Plantation Bauxite Company Ltd. at Christianburg but did not mine there.

A comparison of bauxite production in long tons for the years 1956 and 1957 is given below:

	1957	1956
Demerara Bauxite Co.	1,976,880	2,236,440*
Reynolds Metals Co.	225,023	244,526
Total	2,201,903	2,480,966

* Includes tonnages worked on behalf of Plantation Bauxite Co.

Diamond production amounted to 29,037 metric carats, a decrease of nearly 800 carats from the 1956 total. The entire production came from shallow workings or land claims, the dry weather drastically reducing the water supply available for washing.

Gold production was increased because of a small but relatively rich strike which was made in the Akaiwong area of the Cuyuni River where 200 men produced about 4,000 ounces of alluvial gold mostly in nugget form.

A comparison of gold production in troy ounces for the years 1956 and 1957 follows:

	1957	1956
British Guiana Consolidated Goldfields Ltd.	10,578	12,759
Other Groups	1,900	1,663
Individual Small-Scale Workers	4,013	1,393
Total	16,491	15,815

CHILE

The mining industry in Chile had a good year in 1957. Production was high in the larger copper mines as well as in the nitrate properties and there was increased activity in iron mining. The Chilean Government did not take any steps to decrease the production of copper in spite of the falling world market price of this metal. The Caja de Credito Minero, which is the government ore buying agency, helped many of the smaller operators to keep in production by continuing to purchase copper ores and concentrates at prices which were equivalent to roughly 30 cents per pound. In spite of this assistance, many of the marginal operators were forced to close. Increased operating costs caused by inflation, with decreased returns because of the dropping price of copper, brought about these shut-downs. The value of the peso fell about 40 percent with the official exchange going from approximately 500 pesos to the dollar at the start of the year to very near 700 pesos at the end of December.

The Chuquicamata mine of the Chile Exploration Company increased output of copper by about 1.5 percent, going from 532,008,343 pounds in 1956 to approximately 540,195,146 pounds in 1957. However, this increase does not truly reflect the activity that has gone on at this property, where the total tonnage of overburden and ore moved daily has increased to roughly 140,000 tons. This tonnage has been made possible through the purchase and acquisition of new locomotives, shovels and two rotary drills.

At the Andes Copper Mining Company mine at Potrerillos, copper production went up about 1.3 percent, from 86,330,173 pounds in 1956 to approximately 87,437,221 pounds in 1957, in spite of diminishing ore reserves. The concentrator, which can handle approximately 24,000 tons of ore per day, has been working to capacity. In the meantime, development work on the new El Salvador mine, which is to replace the Potrerillos mine, is more than satisfactory. The Inca Adit at El Salvador, has been driven over 3,300 meters, which is well beyond the half-way mark. Work will soon get under way on a turnout for the main haulage drift, which will lie beneath the ore passes and loading chutes. The 2600 and 2660 meter levels are also being pushed to speed development of the block caving system. It is estimated that the El Salvador ore body contains 500,000,000 tons of 1.6 percent copper ore and that production will get under way in 1959.

The Braden Copper Company mine at Sewell had a lower production in 1957 than during the previous year. It produced approximately 339,024,483 pounds in 1957 as against 347,826,000 pounds in 1956, which represents a decrease of 2.6 percent. Production fell off in April and continued below that of last year through September. This can generally be attributed to labor troubles as there was ample water as well as electricity available throughout the year.

The medium and small copper mines felt the impact of the falling world market price of copper; few of them were able to make sales against future deliveries, thus assuring themselves of what their returns might be. Production figures

on these mines are difficult to get and often incomplete. However, it is known that the Caja de Credito Minero exported 9,241 metric tons of copper in the form of ores and concentrates in 1955 as against 13,874 tons in 1956 and 5,468 tons during the first six months of 1957. During the same periods 14,134 tons, 15,452 tons, and 7,779 tons, respectively, of blister were exported by the Paipote Smelter, which is located near Copiapo. Since the price of copper dropped more rapidly in the last half of 1957 than in the first half, it is reasonable to assume that the production of copper ores and concentrates of the medium and small mines will be well below that of 1956. Among the medium-sized producers those in the strongest position at the end of 1957 were the mines operated by Cia. Mineray Comercial Sali Hochschild, Cia. Minera Disputada de Las Condes, and Cia. Minera du MZaita, which have foreign capital behind them. Cia. Minera Cerro Negro, which is owned jointly by the Caja de Credito Minero and the Corporacion de Fomento, has had a fairly good year and should continue to operate throughout 1958 since they have reported locating a rich deposit in their mine out of Cabildo. On the other hand, Cia. Minera Tocopilla, which was the principal medium-sized mine in the north of Chile, ceased operations at its Tocopilla mine due to labor difficulties and is merely working over old dumps. It is doubtful that this mine will resume operations in view of low copper prices. Callejas y Cia, which operates a number of small mines in the north have threatened to curtail mining activities unless some help is forthcoming from the Chilean Government.

The iron ore production of Chile, though relatively small in comparison to that of copper, is fast growing in importance with an increasing number of producers in the Ovalle, La Serena, Valparaiso, Copiapo, and Chanares areas. Of the existing iron ore producers, the Bethlehem (Chile) Iron Mines are working the largest deposit at the Romeral mine near La Serena where there are an estimated 20,000,000 tons of reserves. Production at this mine is not being pushed as Bethlehem seems interested in producing only enough ore to comply with the contract to supply the steel mills at Huachipato. The firm is continuing to buy iron ore from small producers in the area and shipping upwards of 100,000 tons of ore per month including shipments to C.A.P.

Cia. Minera Santa Fe has been expanding its activities and production from its mines in the Ovalle, Cristales, and Chanares areas. This company has been installing a system for mechanized loading at the port of Chanares. There are three other companies that merit mention in the production of iron ore. These are Cia. Minera Santa Barbara, at Vallenar, Cia. Minera Cerro Colorado, and Cia. Minera Cerro Iman at Vallenar and Copiapo, the latter two being subsidiaries of the Cia. Salitrera Tarapaca-Antofagasta, which still has fairly important nitrate holdings in Chile.

It is interesting to note that the production of nitrates for the first nine months of 1957 was 18 percent higher than for the corresponding period of 1956, going from 824,106 metric tons in 1956 (January-September) to 972,124 tons in 1957. During these same periods, the production of iodine, which is a by-product of the Chilean nitrate industry, went from 468,247 kilograms to 938,801 kilograms or an increase of 110.1 percent.

During 1956, there was a three-month strike at the nitrate properties of the Cia. Salitrera Anglo Lautaro's Maria Elena and Pedro Valdivia mines. These two properties account for better than 50 percent of the nitrates produced in Chile. Anglo Lautaro personnel advise that production is still below what it should be as a result of this strike, and it is hoped to get Anglo Lautaro production back to normal during 1958.

Within recent months, the Cia. Salitrera Tarapaca-Antofagasta has reduced its operations to two properties, Victoria and Humberstone, while Luis Uruticoechea has also cut down to two working properties: Algorta and Granja. In the Antofagasta "pampa," the only other nitrate company in operation is Cia. Salitrera San Martin, while in the Taltal "pampa" Cia. Salitrera Iquique operates Chile mine and Alemana mine and Cia. Salitrera Flor de Chile operates Flor de Chile mine. There is one other nitrate producer in Chile which is Cia. Salitrera Santo Rosa de Huara working inland from Iquique. It is doubtful, however, that this little company will long survive in view of increased costs and antiquated working methods.

COLOMBIA

During 1957 South American Gold & Platinum Company acquired all of the outstanding ordinary and preference shares of Frontino Gold Mines Ltd. in exchange for South American Gold's six percent, eight-year debentures making Frontino a wholly owned subsidiary. In 1956, South American Gold had added substantially to its holdings in Frontino, and the management of Frontino had suggested that South American offer to buy the capital stock of those stockholders who did not wish to retain their interest in the company under new management and financial policies.

During the year, South American Gold stockpiled much of its gold and platinum because of a new 15 percent export tax. Production of gold during the first half of the year was 74,946 ounces, while platinum output during that period totaled 6,659 ounces.

St. Joseph Lead Company entered the field with an 88 percent interest in a new firm called Cia. Minera San Jose Inc. The latter had been granted a mining concession for exploration of a promising lead outcrop near Bogota. Exploration work continued during the year.

During the six-month period ended June 30, 1957, Pato Consolidated Gold Dredging Ltd. dredged 12,395,000 cubic yards to recover 49,814 ounces of fine

Copper Production in Chile by the Anaconda Company and Kennecott Copper Corporation Mines in Pounds for 1955, 1956, and 1957

Mine	1955	1956	1957
Anaconda (Chuquicamata)	461,482,227	532,008,343	540,195,146
Anaconda (Potrerillos)	84,699,879	86,330,173	87,437,221
Kennecott (Braden)	309,942,000	347,826,000	339,024,483

Latin America

gold, compared with 13,407,000 cubic yards to recover 110,910 ounces in the same period of 1956. During this period, the No. 2 dredge was unproductive while undergoing repairs and alterations and moving to a new location. In the second quarter of 1957, dredges No. 1 and 4 were digging flotation toward new dredging sites with a consequent reduction in output.

ECUADOR

During 1957 Compania Industrial Minera Asociada (CIMA) increased its output of gold from 14,652 ounces in 1956 to 16,017. The firm has been seeking to extend its reserves and now has

enough to ensure operations for another two years. They have reopened old workings of the South American Development Company for exploration, and have also located a vein on a small concession at Ayapampa, about 23 kilometers from Portovelo. Both are being mined and shipped to the company mill at Portovelo which is currently handling about 170 tons daily from these and other properties.

The Ecuadorian Mining Company which had sulphur operations at Tixan, did not produce during 1957. The owner of the property, Executive Board of Public Assistance of Chimborazo, has offered the concession to the highest bidder.

A number of concessions were granted by the government last year. Among them are the following: Enterprise Ecuatori-

anna Company Ltd., in the province of Guayas, to mine iron ore; National Mines, in the province of Pichincha and Cotopaxi, to develop copper and zinc minerals, and in the provinces of Rios and Cotopaxi for auriferous washing plants; C. Suarez and J. Simon, in the province of Cotopaxi, to mine nickel and other metals; L. B. Kishe and P. Carrasco, province of Napo-Pastaza for auriferous washing plants; Gustavo Diez Delgado, province of Pichincha and Cotopaxi, to develop copper, lead, and zinc; Julio and Arturo Vinuesa, province of Azuay, for lead and copper, gold and silver.

GUATEMALA

Guatemala's mining industry is growing rapidly, spurred by attractive concessions granted by the Government, and a chance to explore practically virgin country insofar as mines are concerned.

The Compania Minera de Guatemala, S. A. and Compania Minera de Huehuetenango, S. A. have at present the two largest operations. The former runs and efficiently manages operation of mine and flotation mill at Caquiquec, Alta Verapaz treating a monthly tonnage of 6,863 tons. 1957 output was 11,206 tons of lead concentrate and 15,436 tons of zinc concentrate. The latter company is operating a mine and modern oxide lead flotation mill at Villa Linda, Huehuetenango, which milled 30,736 metric tons of ore of 13.2 percent grade in 1957.

Looking over the field and attempting to gain a foothold are: Minas Verapaz, S. A., subsidiary of Eagle-Picher Company, and recent acquire of the Purullá mine from the Compania Minera de Guatemala, S. A.; Compania Minera Maya, S. A., an exploration enterprise in which the San Luis Mining Company and the New Port Mining Company have interests; Hanna Coal and Ore Corporation, which recently acquired exploration rights to 62,000 hectares of ground in the Lake Izabal area; W. R. Grace & Company and Bunker Hill Company, who have joined forces and placed geologists in the field for an active search; Minas de Guatemala, S. A., subsidiary of American Zinc, Lead & Smelting Company, which is diamond drilling a prospect near Chiantla, Dept. of Huehuetenango; and Kelly Safie y Cia, Ltda., which plans to mine a high grade antimony vein.

Other companies recently formed are: Promotora Minera, S. A., Explotadora Minera Quiché; Compania de Minas Trinidad Limitada, Compania Minera Los Altos Ltda.; Explotadora Minera de Choacús, and Mid-America Minerals Association.

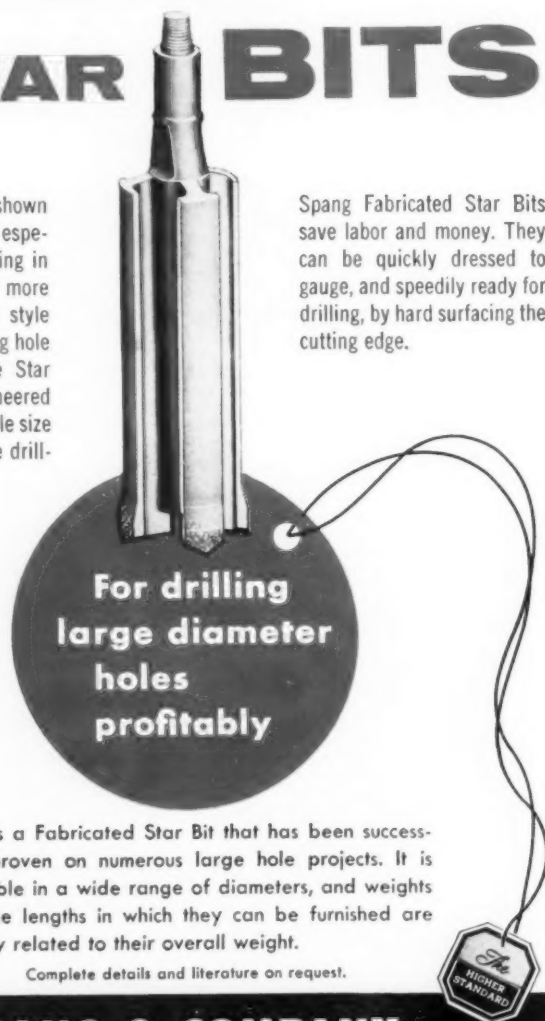
There are at present no smelters operating in Guatemala. A few tons of lead metal are obtained by crude smelting of high-grade ore by a few small mine owners and lessees. This lead is all for local consumption.

PERU

With the current world situation one of declining prices for lead, zinc, and copper, the Peruvian mining industry fortunately is able to turn to iron ore developments to supplement its income. Marcona Mining Company has passed the 10,000,000-ton mark in shipping high-grade iron ore through the Port of San

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Latin America

Juan and is now operating at a rate of around 3,000,000 tons annually. (1957 shipments totalled 3,239,094 long tons).

Adding great impetus to future Peruvian iron ore production was the granting at year's end of a \$4,800,000 credit by United States interests to Pan American Commodities, S.A., to finance the Acari iron ore project. First steps are already underway. These include construction of a new pier at San Juan Bay and a 50-kilometer highway connecting the port with the mine. First shipments are expected to begin in the middle of 1958 at a rate of 1,000,000 tons annually.

The \$200,000,000 investment in the Toquepala copper project by Southern Peru Copper Corporation is already running over that figure. Latest estimate indicates an additional \$30,000,000 will be needed to bring the mine to production. In 1957, the \$3,000,000 mole and pier at Ilo were completed by Foley Brothers; warehouses, townsite, and housing were almost completed; and the largest part of the rail line from the port to the mill had been laid. Completion date is set for 1960.

Cerro de Pasco Corporation finished its \$25,000,000 hydroelectric power project in 1957, and began transmitting power from the new plant to Oroya, where Cerro de Pasco's lead-zinc smelting and refining operations are located. Open-pit copper mining was started on a small scale at the Cerro de Pasco mine in the Central Peruvian Andes, during the year; there the firm used power shovel mining for the first time. Plans were made during the year for a more thorough examination during the 1958 dry season of the Antamina copper property about 100 miles northwest. This property is estimated to contain about 100,000,000 tons of 1.5 percent copper. Unfortunately toward the end of 1957, the firm announced an 11 percent cutback in copper output as a result of the prevailing unfavorable market conditions and the status of some of these newer projects remains uncertain.

The low non-ferrous prices forced Volcan Mines Ltd. to stop work at its Carahuacra mine and concentrator. Operations were also reduced at the firm's Ticlio concentrator high in the Andes Mountains. Minerals Inc. decided not to develop the Chavin lead-zinc-copper-silver mine. Consolidated Guayana Mines then reorganized as Latin American Mines Ltd. and placed the Chavin on a standby basis until higher metal prices enable reopening of the property.

St. Joseph Lead Company and Santander Mining Company formed Compania Minerales Santander Inc. to mine lead-zinc-copper-silver deposits near the headwaters of the Chancay River, west of the Rio Pallanga mine. Output is scheduled for the middle of 1958.

Cia. Minera Condoroma, S.A., operating the Condoroma lead-zinc-silver mine in the province of Espinar, department of Cuzco, decided early in the year to double capacity of its concentrator to 200 tons daily. Exploration had proved 240,000 tons of ore in the Condoroma property and 100,000 tons in the nearby Kata property.

MEXICO

Mexico's largest increase in metal production in 1957 came in the production of manganese ore. Total output in 1957 was 791,253 metric tons, compared with

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Mine Production of Metals and Minerals in Metric Tons in Mexico in 1954, 1955, 1956, and 1957

Commodity	1954	1955	1956	1957
Gold	12,203	11,526	11,287	18,569
Silver	1,247,207	1,461,791	1,363,803	1,486,974
Copper	52,066	52,245	52,924	91,191
Lead	211,681	211,211	204,406	209,744
Zinc	198,106	274,581	250,270	244,238
Iron	305,448	442,050	502,729	566,945
Manganese	79,561	37,078	487,608	791,253
Antimony	3,880	3,807	3,853	5,145
Mercury	506	1,040	726	695
Graphite	20,435	33,412	30,766	23,488
Tungsten	431	370	236	155
Arsenic	2,722	2,976	2,436	4,634
Sulphur ¹	N.A. ²	500,000	775,000	1,000,000

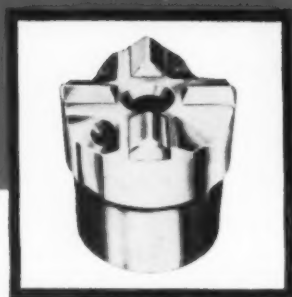
1. Estimated. 2. Not Available.

487,608 tons in 1956. Much of the increase came from the Autlan district of

the state of Jalisco where Bethlehem Steel Corporation has a substantial interest.

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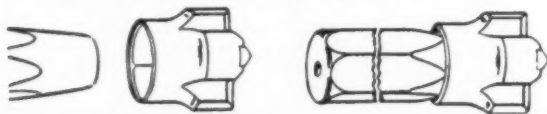
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Another large producer was the Parian district of Oaxaca state.

Mercury metal output decreased in 1957. The tonnage produced amounted to only 695 tons, compared with 726 tons in 1956, and 1,040 tons in 1955.

The Federal Government, through its Mint Department, produced silver coins valued at \$59,676,450. The country produced 1,486,974 metric tons of silver during the year, compared with 1,363,803 in 1956. Much of this was shipped to West Germany.

Sulphur (Frasch process) output hit an all-time high of almost 1,000,000 metric tons: 775,000 in 1956 and about 500,000 in 1955. Mexico is now the world's second largest producer and exporter. In 1957 exports were about 850,000 tons, of which about 500,000 were to the United States. Largest producer was Pan American Sulphur Company which shipped 678,000 tons in 1957. Gulf Sulphur Corporation shipped 170,000.

All production comes from the Isthmus of Tehuantepec where Texas Gulf Sulphur Company's \$10,000,000 plant operated throughout the year and stockpiled about 100,000 tons. Freeport Sulphur Company is financing an exploration program with the Sulphur Exploration Company on a 29,000-acre concession. If sulphur is found a plant will be built.

Texas International Sulphur Company's new 350-ton-per-day plant was building during the year and should reach production in 1958 from its Frasch operations near Texistepec.

A 47,665-hectare mining zone in the state of Oaxaca was removed from the jurisdiction of the Commission for Mining Development and turned over to the National Nuclear Energy Commission for exploration and development of uranium, thorium, and other radioactive metals. The region takes in the municipalities of Telixtlahuaca, Sosola, and Etla; concessions already granted in the area will not be affected.

SURINAM

Bauxite exports totaled 3,377,000 metric tons which is slightly less than previous year's record of 3,482,500 metric tons. Demand for bauxite mined by Alcoa's subsidiary Surinam Bauxite Co., Ltd. went down, which was but partly compensated by raised shipments by Billiton Company of Surinam, Ltd. to Olin Mathieson Chemical Corporation. However, value of exports amounted to nearly \$27,000,000 against \$24,000,000 in 1956.

Negotiations between the Government and Alcoa concerning the \$150,000,000 Brokopondo multi-purpose hydro-electric project were completed by the end of the year. Final decision was arrived at in January 1958, when Surinam's legislative body officially approved the project and the final 75-year joint venture agreement was signed.

Moengo mine of Surinam Bauxite Company, Ltd. shipped a total of 1,996,500 metric tons of bauxite compared with 2,138,000 metric tons in 1956. Shipments in 1957 included 1,798,500 metric tons of metal-grade bauxite, 116,000 metric tons of calcinated bauxite, and 82,000 metric tons of chemical-grade bauxite, all grades coming from the Ricanau Hill deposit.

Paranam mine of the same company shipped 568,000 metric tons of metal grade bauxite, coming from the Rorac and Truly Hill deposits, against 759,500

Latin America

metric tons in 1956. Towards the end of the year a new jig plant was added to the heavy media separation plant treating low-grade ferruginous bauxite. Besides, the 4,500-hp diesel-electric cutterdredge went into operation to remove overburden of the buried Onoribo IV ore body. So, total shipments of Surinam Bauxite Co., Ltd., amounted to 2,564,500 metric tons compared with 2,897,000 metric tons in 1956.

Billiton Company of Surinam, Ltd. shipped 812,500 metric tons of bauxite, a substantial rise over last year's shipment of 585,000 metric tons. Included in the 1957 shipments are 17,000 metric tons of chemical-grade bauxite. Backed up by the long term delivery-contract with Olin Mathieson Chemical Corporation, the company may further raise its output in 1958 to nearly 1,000,000 tons. To achieve still higher production, the company has placed an order for a bucket-wheel excavator and a conveyor system to handle the ever increasing amount of overburden. A new kiln has been put into operation at the company's Smalkalden drying plant.

Surinam Bauxite Company, Ltd. and Billiton of Surinam, Ltd. continued their bauxite explorations in the areas surrounding their mining activities. Reynolds Surinam Mining Company, Ltd. explored for bauxite in the Corantijn River basin in northwestern Surinam. Recent discoveries of bauxite deposits in British Guiana near the Corantijn River explain the exploration activities in this area. Guiana Exploration Company, Ltd. (Kennecott) suspended its bauxite exploration program in this country.

Gold shipments to Paramaribo totaled 6,450 ounces which is again less than previous year's figure of 6,700 ounces. Sarakreed Goldfields, Ltd. shipped 3,500 ounces from its Lawa properties. The option held by U.S. interests to dredge these properties have not yet resulted in active developments. Surinam Gold Mining Company, Ltd. shipped 900 ounces from its Headly Reef. Canadian interests acquired an option to work the company's properties. Combined U.S. and Canadian interests examined the Rosebel property owned by a local miner. Though the existence of a considerable volume of gold-bearing residual clay has been inferred, the grade did not prove to be high enough to warrant further development at the moment. A hole drilled by the Government Geological & Mining Service showed sludge assays at depths between 26 and 60 meters ranging from about \$0.40 to \$9.00 per ton of recoverable sludge material.

Surinam Mining Company, Ltd. (Union Carbide & Carbon Corporation) finished the exploration of the Maripa Hill manganese deposit. The grade of the washed ore proved to be between 25 and 30 percent manganese, which is, considering the rather small tonnage of the deposit, too low to warrant mining and shipping of the ore.

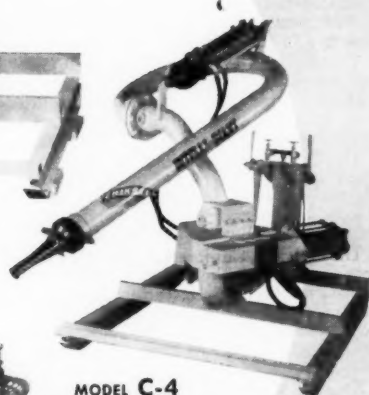
Some further laboratory and field work done by the Geological & Mining Service indicated that, in the northern pegmatite belt, the occurrence of minerals like columbite-tantalite and cassiterite may likely be more extended than has been thought previously. The Service reported new discoveries of alluvial columbite-tantalite in the De Goeje Mountain in the southeast part of the country. The occurrence of some platinum in the gold-bearing gravels in this area has been confirmed by preliminary field work.

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ASIA

BURMA

The Government of the Union of Burma has adopted a vigorous program of encouragement for the mining industry. In 1957 these programs were conducted by the government financed Mineral Resources Development Corporation with the aid of foreign mining engineers and geologists. The Union Government decided to set up and operate an iron smelter so the M.R.D.C. intensified the search and testing of iron deposits to provide the necessary iron ore.

The Corporation also investigated, tested, and partly opened up a large zinc deposit at Loung Chaung. An all-weather road was built from the mine to Mongpaw which is 38 miles east of Taungyi in the Southern Shan States.

The Corporation opened an ore buying depot at Tavoy, equipped with a magnetic separator and assay office to buy the local tin-wolframite ore and concentrate.

The Corporation continued to work the Yadana Pone wolframite mine in the Mergui District, and during the year shipped 300 tons of mixed tin wolframite concentrate to Rangoon.

The Burma Corporation (1951) Ltd. jointly owned by the Union Government and Burma Mines Ltd., (a London Company), state that geological exploration by diamond drilling in the concession and an aerial survey over 550 square miles was made.

No new joint mining venture was entered into by the Government, but negotiations were commenced with Mawchi Mines Ltd. who work a very large Tin/Wolfram Mine at Mawchi in the Southern Shan States. It was reported that the Union Govt. would repay the £450,000 6% public loan obtained by the Company to rehabilitate the mine, and provide another £500,000 in local currency. Due to the heavy fall in the Wolfram values it is very doubtful if these negotiations will be carried further.

The Union Government wants to attract foreign capital for mining ventures. It has publicly stated that there will be no nationalization of mines for 20 years.

In 1957 production of high grade lead-zinc-silver ore from the famous Bawdwin mine was 117,017 long tons (111,198 in 1956). Concentrate smelted was 47,361 long tons versus 52,306 in 1956. Ore reserves were announced by the company on July 1st as follows: 2,323,508 long tons (2,440,535 in 1956); containing 15.8 ounces silver per ton (15.7); 20.6 percent lead (20.4); 12.7 percent zinc (12.6); and 0.93 percent copper (0.89).

Production of Metals and Minerals in Burma For Key Years From 1939 to 1957

Year	Silver ¹	Tin Concentrate ²	Wolframite Concentrate ³	Lead ³	Zinc Concentrate ³	Copper Matte ³
1939	6,175,000	5,441	4,342	77,180	59,347	7,935
1948	415,000	1,768	378	11,596	2,943	115
1949	75,199	1,469	278	1,481	—	38
1950	—	1,750	165	371	—	—
1951	280,270	1,295	483	5,035	—	254
1952	54,783	1,306	792	9,093	4,275	134
1953	645,970	1,114	767	9,846	6,275	80
1954	1,278,289	816	443	22,561	11,283	224
1955	1,337,895	673	578	28,015	14,421	358
1956	1,358,513	1,193	1,438	14,885	13,953	379
1957 ⁴	1,238,259	1,140	948	13,892	14,922	369

1. Ounces. 2. Metric tons. 3. Long tons. 4. 1,788 tons mixed wolframite-tin concentrates exported.

CEYLON

There was a further recession in the graphite mining industry during the year 1957. The exports during the year were about 11 percent less than the exports for the previous year. The large mines worked continuously throughout the year on a restricted production basis. The unprecedented rains at the end of the year resulted in greatly increased inflow of water in some of the large mines thereby increasing pumping costs considerably.

The principal graphite mines continue to be worked by Messrs. Bogala Graphite Ltd., Kahatagaha Mines Co. Ltd., and H. L. De Mel & Co. Ltd.

Ceylon Graphite Exports 1951 Through 1957 In Long Tons

Year	Quantity
1951	12,621
1952	7,659
1953	7,218
1954	7,755
1955	9,878
1956	9,207
1957	8,190

No figures for the production and value of gemstones are available. However, gemstone mining continued and it may be estimated that about 1,500,000 Rupees worth of gemstones are produced annually. The principal varieties are the ruby, sapphire and its star varieties, cat's eye, zircon, topaz, aquamarine, and moonstone.

The experimental plant for the recovery of monazite from beach sands continued to work throughout the year. Due to lack of machinery only No. 2 grade monazite assaying 70 percent rare earth oxides was produced. A stock pile of about 225 tons of No. 2 grade monazite awaited further treatment at year's end. An Exolon magnetic separator is on order for the plant.

CYPRUS

The United States firm—Cyprus Mines Corporation—once again was the most important mining and metallurgical enterprise on Cyprus in 1957. While ore output from the only operating mine, Mavrovouni, was down slightly to 923,831 dry long tons from 933,685 in 1956 the company established very important gains in recovery of all mineral products excepting flotation pyrite. For details of the rapidly growing trend in mineral recovery during the last four years see the enclosed table. The company's three other leased mines Skouriotissa, Mathiati, and Apliki were not operated during the year.

Exports of Pyrite Produced by Hellenic Mining Company Ltd. in 1954, 1955, 1956, and 1957 in Tons

Country	1954	1955	1956	1957
Western Germany	140,818	148,761	202,534	223,278
United Kingdom	38,849	43,249	—	—
Holland	34,109	38,962	47,735	2,200
Switzerland	3,376	10,206	—	—
Italy	—	23,448	44,591	72,645
France	—	5,659	3,937	—
Czechoslovakia	—	—	—	14,179
Totals	217,152	270,285	298,797	312,302

The Hellenic Mining Company Limited holds a total of 42.55 sq. miles of mining leases, in the areas of Kalavassos-Asgata, Mitsero-Agrokipia, and Kambia-Sha; and 32 prospecting permits in various parts of the Island. Development of important pyritic ore bodies has continued in the Mitsero-Agrokipia mining lease area, where an overburden of over 1,500,000 tons was removed in open pit operations. An up-to-date pyrite beneficiation plant, in the same area, commenced operation early in the year. Development in the Kambia-Sha mining lease area involved the removal of over 2,150,000 tons of overburden. Plans have also been completed and work is in hand for the erection of a second loading installation, on the North coast, besides the existing one at Vassiliko, on the South coast. The average number of men employed during the year was 1,306 and production of pyrites amounted to 305,955 tons against 299,857 tons during 1956.

Mineral Production of Cyprus Mines Corporation in 1954, 1955, 1956, and 1957

Commodity	1954	1955	1956	1957
Copper concentrates ¹	73,289	86,351	101,689	112,434
Cement copper ¹	2,314	3,225	3,094	3,431
Cupreous pyrites ¹	75,614	100,003	142,732	176,253
Gold in copper concentrate ²	6,302	6,467	7,163	8,111
Silver in copper concentrate ²	60,890	62,381	69,988	85,886
Flotation pyrite ¹	452,805	500,778	587,723	529,871

1. Dry long tons. 2. Fine ounces.

The Cyprus Asbestos Mines Ltd. has a lease over practically all the asbestos bearing areas in Cyprus. Mining operations were as usual carried out during the dry season, which is reported to have been unusually short in 1957. A total of 1,421,703 tons of rock was quarried against a total of 1,210,000 tons during the 1956 season. Recovery of marketable asbestos fiber amounted to 15,028 short tons against 15,400 short tons in 1956.

The Cyprus Sulphur And Copper Company Ltd. reports that during the year 38,376 tons of pyritic ore were mined from Kinoussa mine in addition to 39,326 tons mined from the Kinoussa open pit mine. Kinoussa mine will be closing down early in 1958 as the main part of the economic grade of ore had

Exports of Minerals From Cyprus in Long Tons For 1956 and 1957

Mineral	1956	1957
Iron pyrite	821,727	762,501
Cupreous pyrite	64,455	226,334
Cupreous concentrate	119,211	139,192
Cement copper	3,700	3,900
Chromium ore	5,826	5,070
Asbestos	12,505	11,886
Gypsum rock	25,424	41,687
Gypsum calcined	3,023	1,257
Umbers	4,748	4,317

already been mined by the end of December, 1957. Exports during 1957 amounted to 54,482 tons of cupreous pyrite and 9,660 tons of flotation pyrite.

The Cyprus Chrome Company Ltd., of Ayios Nicolaos continued operating the chrome ore mine on Troodos. A total of about 1,600 tons of concentrate was produced. Exports during the year amounted to 5,070 tons of ore and concentrates.

Mr. M. W. Berdy of Larnaca operated the Troulli mine and produced 832 tons of copper concentrate of which 777 tons were exported during the year.

HONG KONG

During 1957 the most active mining in Hong Kong was at the magnetite iron ore mine at Ma On Shan. A monthly average of 8,000 tons was shipped, mainly to Japan. A wet magnetic plant beneficiates the ore to 60 percent grade. During the year considerable damage was done to the mine by a typhoon and as a result production was slowed. Open pit mining has been suspended and underground mining started. There are four levels extending into the ore body. With the changeover from open pit to underground mining the number of miners was reduced; there are now less than 1,000.

The low price of tungsten brought to a halt almost all mining of wolframite. Only 36 tons production was reported. Normally the largest production of wolframite comes from underground mining with only a small amount from alluvial and placer deposits in the stream beds and paddy fields. Altogether there are 17 workings that can be classified as mines: Two as major workings (Needle Hill and Lin Fa Shan) which use some mechanical equipment; and 15 as minor workings.

The production of lead ore during the year from the Lin Ma Hang mine was very low; only 129 tons. This is high grade ore that was cobbled by hand. In the Lam Tsuen Valley where the Mountain Lead Company have a considerable prospecting area no work was done.

The graphite deposit on West Brothers Island was worked continuously throughout the year. An average of 300 tons a month was exported, mainly to Europe. The quality of this graphite is generally high.

During the year the Department of Mines continued to administer and control mining. Amendments to the local Mine Ordinance were made. The University of Hong Kong in its Department of Geology has over the past few years installed equipment and apparatus for research work; mainly in the field of mineralogy. A close liaison exists between it and the Government Mines Department.

INDIA

As in the past, iron and steel production occupied much of the country's attention during 1957. Seven major steel companies in Japan made an agreement with the Indian State Trading Corporation for the import of 7,200,000 tons of Indian iron ore over a five-year period. Total exports of iron ore in 1957 amounted to 1,214,237 tons valued at Rupees 66,200,000. Of this output, Japan received 582,465 tons; Poland, 173,914; Italy, 126,310; Yugoslavia, 114,465; Czechoslovakia, 112,904; Germany, 87,-

Production of Minerals in Israel From 1953 to 1957¹

Commodity	1953	1954	1955	1956	1957 ²
Phosphate rock ³	23,092	58,195	71,779	115,572	150,000
Potash ²	4,426	18,343	15,555	45,398	78,000
Ball and fire clay ²	5,001	8,381	6,415	7,324	8,400
Cement ²	464,755	563,099	633,538	612,837	700,000
Salt ²	29,004	26,636	20,290	25,972	30,000
Quartz sand ²	12,026	11,541	12,583	15,722	16,500
Gypsum ³	22,250	30,200	50,000	50,000	65,000

1. Metric tons. 2. From Statistical Bulletin of Israel. 3. Estimated.

610; and the remainder of 16,569 tons went to the United States, the United Kingdom, and The Netherlands.

A final contract was signed with the Indian Steelworks Construction Company of London during the year. This plant will go into initial production in 1959 at a cost of about Rupees 138 crores. Construction of two other steel plants continued during the year: the Rourkela plant financed by German industrialists and the Russian designed plant at Bhilai. Meanwhile, a \$130,000,000 plant expansion was on schedule at Jamshedpur where Kaiser Engineers Division of Henry J. Kaiser Company is undertaking the work for Tata Iron and Steel Company. Production will be increased from about 1,300,000 to 2,000,000 ingot long tons annually.

During the year, it was announced that three up-grading plants would be erected for the improvement of the quality of low-grade manganese ore. The project will be a joint venture of public and private enterprise. Content is expected to be increased from the present 30 to 38 percent Mn to 46 to 48 percent Mn. One plant will be in Belgaum, another in Vidarbha, and a third in the Panchmahal area. During the first quarter of 1957, India produced 430,000 tons of manganese ore. This was an increase over output of October-December 1956, but compared with the corresponding quarter of 1956, it showed a drop of 69,000 tons. Further figures have not been received.

The Indian Atomic Energy Department reported location of a 3,300,000-ton ore deposit in northeast India, said to contain 300,000 tons of thorium, and 10,000 tons of uranium, and about 80,000,000 tons of ilmenite.

ISRAEL

Mineral development in Israel attained new heights during 1957. Most significant was the completion of the copper cementation plant at Timna. New production records in phosphate and potash were achieved and exploration of highly refractory flint clay deposits was initiated.

As the year ended, Israel Mining Industries, Ltd., neared completion of the copper cementation plant at Timna, situated some 15 miles north of the Red Sea Port of Eilat. The plant is designed to treat 1,500 tons of copper ore per day, averaging 1.5 percent Cu. First copper

production is expected by summer of 1958. A substantial part of the equipment was obtained from German sources, under the West German-Israel Reparations Agreement. Mining of copper ore commenced late in 1957 from the open pit mine situated on the outcrop of the sedimentary ore body and development of an underground mine is to start in 1958. A drilling program was commenced in 1957 to prove up additional ore reserves, and will be continued in 1958. It is indicated that 50,000,000 tons, in addition to the already proven 12,000,000 tons, may be available.

Output of beneficiated phosphate rock advanced from 115,572 tons in 1956 to 150,000 tons in 1957. Ore averages 24 percent P₂O₅ and is upgraded to 28.5 by air separation at the mine site at Oron, in the Negev desert. The Negev Phosphate Company Ltd., operators of the mine, continued their studies to improve recovery and quality of the product.

The beneficiated rock is shipped to Haifa, where it is processed into superphosphate by Fertilizers & Chemicals, Ltd., largely for local consumption. Export of beneficiated phosphate rock and superphosphate increased considerably during 1957.

Production of muriate of potash by the Dead Sea Works, Ltd., at Sdom, at the south end of the Dead Sea, was 78,000 tons as compared to 45,000 tons in 1956. Most of the product is exported.

JAPAN

Japan's mining and metallurgical industries started 1957 with plans for high output from local mines plus imported scrap, concentrates, and ores. In May, however, the Japanese government took emergency measures to recover the balance in foreign exchange and curtailed funds available for imports.

Monthly production of copper, lead, zinc, nickel, pyrite, etc. was at a high level during the early part of the Japanese fiscal year (April 1, 1957 to May 31, 1958). With the decline in foreign markets starting in August the metallurgical industry reduced output. Despite this curtailment in late 1957 electrolytic copper output hit a new peak and domestic copper concentrate production increased over 1956. Copper smelting and refining was reduced 15 percent at nine plants in October.

Production of Metals and Ores in Hong Kong for the Years 1949 Through 1957

Commodity	1949	1950	1951	1952	1953	1954	1955	1956	1957 ⁴
Iron ore ¹	59,181	169,374	160,684	127,512	123,200	90,800	115,000 ³	122,963 ³	94,182 ³
Tungsten conc. ²	—	—	44,149	217,599	313,721	60,335	51,548	53,500	36,119
Tin ore ³	800	1,000	2,514	1,188	156	—	—	—	—
Molybdenum ³	—	—	250	737	3,327	193	52	—	—
Lead ³	—	—	176	752	645	368	384	198.65	129.61
Graphite ³	—	—	—	—	200	1,840	1,535	2,442	3,305
Kaolin and Clays ¹	—	—	620	4,381	5,934	6,063	5,342	5,463	6,961

1. Metric tons. 2. Pounds. 3. Concentrate. 4. Long tons.

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Production of Metals and Ore in Japan in 1951, 1952, 1953, 1954, 1955, 1956, and 1957

Commodity	1951	1952	1953	1954	1955	1956	1957 ¹
Copper (electrolytic) ³	40,866	94,385	91,065	106,478	113,316	126,156	142,171
Lead (electrolytic) ³	11,116	19,148	23,145	34,114	37,126	46,307	54,042
Zinc (electrolytic) ³	38,244	49,341	54,827	68,108	72,678	136,226 ⁷	138,022 ⁷
Zinc (distilled) ²	18,101	20,686	23,948	32,732	38,875		
Mercury ²	80.0	111.0	220	148.7 ⁶	172	287	409
Antimony ²	221.2	543	1,197	264.4 ⁶	301.9 ⁶	562 ⁶	429 ⁶
Tin (electrolytic) ²	433.4	786	858	886	1,002	1,185	1,281
Pyrite (ore) ²	2,162,344	2,567,053	2,296,389	2,677,847	2,736,143	3,097,497	3,369,029
Silver ³	143,320	185,722	249,210	237,342	227,400	191,814	202,987
Gold ³	176,900	209,210	233,890	9,374,147 ⁶	7,487,600	7,509,055	7,816,456
Titanium sponge ³			51,902	515,414	1,249,787	2,524,681	2,337,298
Aluminum ²				57,515	65,997	67,980	
Nickel ²					5,664	7,252	
Germanium ³					102,711	399,274	1,863,790
Sulphur ²					202,879	247,264	257,568

1. Preliminary. 2. Metric tons. 3. Kilograms. 4. Fine ounces. 5. Grams. 6. Content of ore. 7. Total zinc slab output.

Lead and zinc production was maintained at a high level. In fact domestic mine production of lead was increased to 35,864 tons in 1957 from 29,524 tons in 1956. Electrolytic lead output was 54,042 metric tons against 46,362 tons in 1956. In line with the increased production at the existing refineries, Kunitomi refinery in Hokkaido of Sumitomo Metal Mining Co. Ltd. started refining operation with the actual production of about 300 tons of electrolytic lead per month after October. Zinc concentrate production in 1957 was 135,463 metric tons, 12 percent higher than production of 123,001 tons in 1956.

Mitsui Mining & Smelting Co., Ltd. expanded the capacity of its Hibi copper smelter from 1,100 to 1,500 metric tons per month to meet the capacity of the Takehara refinery. These expansions had been projected by the company to process increased supplies from Sipalay and Bagacay mines in The Philippines.

Dowa Mining Co., Ltd. installed a 100 ton per day sulphuric acid plant at the Kosaka refinery when it increased capacity of zinc production to 600 metric tons per month from 240. Apart from this, the company confirmed a reserve of iron pyrite amounting to 18,000,000 metric tons (S 5 percent, Fe 46 percent) at the Yanahara mine in Okayama Ken. The milling capacity was raised to 60,000 tons per month from 53,000.

Mitsubishi Metal Mining Co., Ltd. expanded the electrolytic capacity at the Osaka copper refinery to 2,800 tons per month from 1,800 in order to meet the expansion of the Naoshima smelter where smelting capacity was raised to 3,000 tons per month from 2,000. In line with the increased smelting capacity at Naoshima the company installed a sulphuric acid plant which recovers 5,400 tons of 50° sulphuric acid and 5,800 tons of 98 percent acid per month.

Nippon Mining Co., Ltd. completed a pyrrhotite mill at the Kawayama mine with an initial capacity of 2,500 metric tons per month which can be enlarged to 7,500 tons capacity. In connection with expansion of the Kawayama mine the Iwakuni mill to treat Kwayama's ore was completed. Output is 175 tons copper concentrate, 260 tons zinc concentrate, and 3,570 tons iron pyrite per month from 7,500 tons milled per month.

Mikachi Smelting Co., Ltd. having connection with Nippon Mining Co. Ltd., installed a plant to recover Au-Ag-Cu contained in zinc slag. This plant has a capacity for recovering 180 tons of materials containing Au, Ag, and Cu by treating 530 tons per month of zinc slag.

Sumitomo Metal Mining Co. Ltd. purchased the idle copper mines of Hakko

and Hamae (both located in Tohoku district) which were under prospecting operation. In September the company discovered a deposit of about 300,000 metric tons containing 1.5 percent Cu.

REPUBLIC OF KOREA

Production of scheelite, amorphous graphite, gold, and iron ore which are Republic of Korea's chief mineral products increased in 1957. The tungsten concentrates output was up slightly to 3,825 metric tons from 3,741 in 1956. This was a high output considering that only six mines were in operation at year's end contrasted with 120 in 1953 when the all time high of 7,456 tons were produced. By early 1958 there were only three mines in continuous operation with drastically curtailed output. They are the Sang Dong scheelite mine and the Dal Sung wolframite mine of the Korea Tungsten Mining Company, and the Ok Bank mine which produces a very high grade scheelite concentrate from pure and high grade ores.

Construction proceeded on schedule for the new synthetic scheelite plant of Korea Tungsten at the Sang Dong mine with completion set by June 1958. The digester building, the precipitation building, and the boiler plant were completed. Utah Construction Company serves as engineering consultant and it is anticipated will continue as operational adviser after the plant is completed.

To meet increasing demands for amorphous graphite production was increased 241 percent over 1956. Graphite was used by local foundries and an increase in exports, especially to Japan, was made.

Output at the Yang-Yang iron mine increased and it is scheduled to reach the 200,000 metric tons per year goal in the near future. Reserves are estimated at only 2,000,000 tons so airborne prospecting and diamond drilling, to increase reserves, are scheduled for 1958 under the International Cooperative Administration.

The Chang Hang copper smelter project of the United Nations Korea Reconstruction Agency was started during the year and is scheduled to be completed in June 1958 at a cost of \$1,460,000. In 1956 an embargo was placed on copper concentrate exports so that the smelter would have a supply to smelt.

Gold output, largely placer, increased during 1957 and was due to test operations of the 6.5 foot connected bucket line dredge at the Dae-Chon mine.

Joint exploration by United States and Korean engineers was carried on at

Asia

Production of Ores and Metals In the Republic of Korea For 1952, 1953, 1954, 1955, 1956, and 1957

Commodity	1952	1953	1954	1955	1956	1957
Gold ²	18,636	16,100	52,250	45,654	47,200	64,400
Silver ¹	—	52,500	50,200	69,767	195,800	276,000
Copper ore ²	9,819	10,144	7,047	13,040	14,766	9,168
Electrolytic copper	—	14 ³	204,723 ³	328,930 ³	907,288	792,535
Lead ore ²	366	260	116	1,362	2,901	1,843
Bismuth conc. ²	279	638	382	407	608	363
Bismuth metal ²	17	299	160	115	172	149
Iron ore ² , ⁴	20,577	18,841	30,996	29,135	62,867	185,412
Manganese ore ² , ⁵	7,416	3,270	1,691	3,450	1,958	3,205
Nickel ore ² , ⁶	1,060	1,126	140	—	500	225
Tungsten conc. ²	3,790	7,456	3,828	2,920	3,741	3,855
Molybdenite conc. ²	11	19	19	22	25	27
Crystalline graphite ²	254	683	713	—	528	260
Amorphous graphite ²	14,806	18,744	13,200	87,900	60,586	147,341
Asbestos ²	—	—	211	60	40	87
Talc ²	3,764	9,483	8,326	6,240	6,292	6,600
Kaolin ²	1,766	8,723	9,457	13,462	9,387	6,622
Pyrophyllite ²	9,830	14,281	10,693	2,688	7,963	4,680
Fluorite ²	—	—	—	—	—	—
(80% CaF ₂)	5,553	9,802	8,872	10,073	3,113	5,119
Monazite ²	85	707	1,005	508	183	355
Barite conc. ²	—	—	—	—	—	—
(98% Ba)	—	918	305	846	675	7
Zinc ore	—	—	—	—	831	564
Pyrite	—	—	—	—	46	550
Zircon	—	—	—	—	0.44	8.45

1. Fine ounces. 2. Metric tons. 3. Kilograms. 4. 50 percent iron. 5. 40 percent Mn. 6. 3 percent Ni. 7. 40 percent sulphur.

Korea's only tin deposit during the year. The deposit, a pegmatite, in Young-wol, Kang-won Province is estimated to contain 600,000 tons of 2.3 percent tin. Prospecting is scheduled for 1958 with International Cooperation Administration funds. Small production was made by a few miners using hand methods.

In 1957 the Korean government transferred ownership of 92 mines to private groups. A total of 312 mines are to be transferred, but lack of investment capital slowed the transactions.

MALAYA

The Federation of Malaya achieved independence on August 31, 1957 within the British Commonwealth; it is unlikely that changes unfavorable to foreign mining interests will be introduced, since approximately 85 percent of the country's total export earnings are derived from tin and rubber.

Of the various minerals mined tin is the most important, inasmuch as Malaya's share of the market covered by the International Tin Agreement is the largest, the allocation for the period December 15, 1957 to March 31, 1958 being 37.5 percent of the total permissible exports amounting to 27,000 tons.

In view of the fact that exports are limited by these restrictions lower output figures must be expected during 1958. This trend became apparent in 1957 when production was 59,293 tons as against the post-war record of 62,295 achieved in 1956. This state of affairs was also reflected in the fall of tin producing units from 784 in 1956 to 738 in 1957.

Export controls called for by the International Tin Council are not, however, the only factor affecting future production. Consideration is being given to the granting of more prospecting and mining leases. An aerial-magnetic survey completed in 1957 under the auspices of the Colombo Plant has reinforced the validity of the statement made by the recently retired chief inspector of Mines of the Federation of Malayan Government to the effect that: "There is as much tin left in the ground in Malaya as has ever been taken out in the past."

The Eastern Mining and Metals Company operated its open-pit iron mine in

Production of Metals and Minerals in Long Tons in Malaya in 1954, 1955, 1956, and 1957

Commodity	1954	1955	1956	1957
Tin	60,690	61,244	62,294	59,293
Coal	224,540	206,118	182,479	152,711
Iron ore	1,212,780	1,466,184	2,444,570	2,972,359
Ilmenite	44,745	53,875	122,176	91,734
Monazite	—	249	631	490
Tungsten	99	106	91	50
Columbite	111	236	276	142
Bauxite	165,621	222,162	264,444	325,629
Gold ¹	20,995	22,838	20,252	11,157
China clay	1,352	1,378	1,155	752 ²

1. Troy ounces. 2. First six months 1957

Trengganu which produced 25 percent of the iron ore imported by Japan. The 1957 production was about 21 percent higher than in 1956. Ilmenite output was about 25 percent lower than in 1956.

The rate of expansion in bauxite mining was stepped-up compared with 1956, 1957 production was 23 percent higher.

Gold production fell by about one half because of a labor dispute which started towards the end of 1956 and lasted six months. As a result the mine became partly flooded making it impossible to resume normal operations for a period of about one year.

As indicated in last year's review, prospecting for uranium was undertaken and a report on a joint Canadian-Malayan aero-magnetic and radioactivity survey is in the final stages of preparation and will be available during 1958.

Number of Active Tin Producing Units in Malaya, end of December 1956, and 1957

Units	1956		1957	
	European	Asian	European	Asian
Dredges	78	0	76	0
Gravel pumping	20	613	19	578
Hydraulic mining	11	2	8	2
Open cast	2	3	2	2
Underground	1	25	2	23
Small workings ¹	1	28	0	26
TOTALS	113	671	107	631

1. Without machinery.

TAIWAN

Mine production of sulphur and coal in Taiwan in 1957 were the highest on

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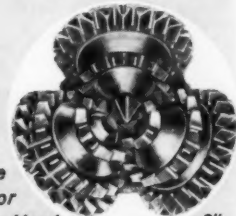
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Brief items about the Sauerman Method... Crescent DragScrapers
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Waste Disposal by Tautline-Scraper

A Foote Mineral Company plant is using the Sauerman Method to solve a difficult sludge removal problem. A 2-yd. Tautline-DragScraper has proved to be ideal for the job. The sludge is handled safely and efficiently—men or machines need not travel on the material, since only the DragScraper and cables enter the disposal area.

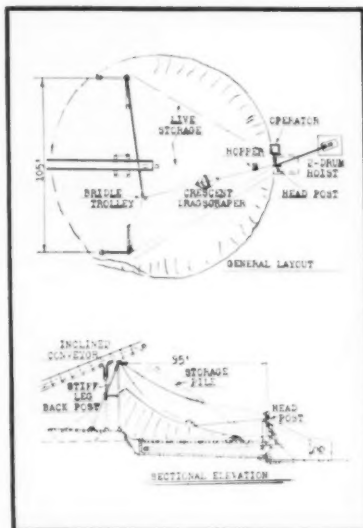
The DragScraper distributes the sludge from the discharge point to a natural valley about a thousand feet long by several hundred feet wide. It is connected to a 2-wheeled plate carrier which runs on a track cable between the headpost and one of the tail masts. The operating cables permit the DragScraper to be hoisted free of the material—a great advantage over conventional hauling methods. A Sauerman 3-drum hoist provides DragScraper power.

(Condensed from Sauerman News No. 148.)



Reclaiming Material to hopper from all sections of a 500-ft. warehouse, the estimated operating cost of this DragScraper Machine is 2.1 cents per ton. (Sauerman News 145).

Rapid Shifting DragScraper is Engineered to Needs of Silica Sand Producer



The Sauerman Method was successfully applied to the requirements of a prominent silica sand producer, as shown in the drawing above. This Rapid-Shifting DragScraper Machine reclaims raw sand from a 6,000-ton stockpile.

The pile is formed by an inclined conveyor leading from the floor of the quarry to the live storage area. The Crescent DragScraper reclaims from storage to a hopper-fed conveyor in front of the head post.

Before the DragScraper was installed, the raw sand frequently bridged across the hopper. Such interruptions in the flow of raw sand to the plant resulted in costly shutdowns. The Crescent prevents this bridging action and provides a steady flow of material for processing.

The Sauerman Method also permits the company to build up a reserve pile of raw sand sufficient for at least one week's production as insurance against a quarry shutdown.

(Condensed from Sauerman News No. 147.)

MORE NEWS AND INFORMATION

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Asia

record. Silver, copper, and iron output increased over 1956. Plans for 1958 call for increased production of coal, gold, copper, and industrial minerals largely used for building.

Sulphur production in 1957 increased to 9,700 metric tons, an increase of 1,300 metric tons over the previous year. This breaks all previous records in the sulphur industry of Taiwan. Pyrite output of 34,000 metric tons in 1957 is 12 percent above that in the previous year. The production of both sulphur and pyrite failed to reach the anticipated figure for 1957 by a slim margin due to the reconstruction of one of the main highways leading to the sulphur mining districts. Production will be increased in 1958 when this highway is completed. Electrical geophysical prospecting was applied to explore for the pyriticiferous in the volcanic regions in northern Taiwan and some new mineral localities were found for future development.

More vein gold and placer gold localities were explored in the Central Range of Taiwan. Further development will be made pending the completion of the cross-island highway which penetrates deep into the higher parts of the Range. Rich copper-bearing auriferous veins were found in the Chinkuashih mine in northern Taiwan, an increase of 300,000 to 500,000 metric tons of ore reserve being achieved.

Production of Minerals in Taiwan in 1954, 1955, 1956, and 1957

Commodity	1954	1955	1956	1957
Coal ¹	2,100,000	2,359,316	2,529,046	2,916,084
Gold ²	763,000	874,399	1,166,400	606,000
Silver ²	960,000	1,988,587	1,575,400	2,024,600
Copper ²	950	1,174	1,701	1,901
Sulphur ²	6,052	4,932	8,491	9,754
Pyrite ²	24,860	29,019	28,666	33,466
Graphite ²	700	695	2,073	2,500 ³
Talc ²	5,600	5,268	6,131	7,000 ³
Asbestos ²	69	366	101	109 ³
Porcelain clay ²	—	470	3,353	4,000 ³

1. Metric tons; 2. Grams; 3. Estimated.

THAILAND

Lower metal prices were the main cause of the mining industry's recession in Thailand in 1957. The closure of tungsten mines was averted by the reduction of the tungsten royalty rate. Tin is the only important metal produced in Thailand, although the tin mining industry was still heavily taxed by unreasonably high royalty rate caused by inflation of the local currency.

Tin production in 1957 is estimated at 13,300 long tons of metallic tin—an increase of over 1,000 tons over 1956 output.

The operations of the Aokam Tin Ltd's revolutionary deep-sea dredge at Bhuket were carried out throughout the year with unexpectedly good results. The construction of another deep-sea dredge of a more conventional design was commenced by Tongkah Harbour Tin Dredging Ltd.

Tromal Prospecting Company also drilled several areas in the sea near Bhuket. Development works continued at the hard rock Chon mine near Takuapa while operations at the Labu mine in Yala were stopped.

Although international tin export restriction was enforced on December 15th 1957, the government did not allocate

Asia

new export quotas for tin producers until the middle of January 1958.

Unlike other tin producing countries, export quotas in Thailand were not based on producing capacities of the mines, as most dredges, regardless of size, were given the same export quotas.

Production of Minerals and Metals in Thailand in 1954, 1955, 1956, and 1957

Commodity	1954	1955	1956	1957
Tin ¹	9,776	11,108	12,481	13,300*
Tungsten ²	1,085	1,126	1,500	800
Antimony ²	1,390	48	20	N. A.
Lead ³	N. A.	12,512	8,000	N. A.

* Estimated. 1. Long tons metallic tin. 2. Long tons of concentrate. 3. Metric tons of concentrate. N. A. Not available.

TURKEY

Prospecting and exploration were the highlights of Turkish mining in 1957. Production generally was lower than in 1956. Geological and geophysical surveys continued for scheelite, chromite, and lignite. Increased production of iron ore was necessary to supply the expanding steel industry.

Chromite production from both the government (Etibank) and private mines decreased. That was accelerated toward year's end as price and markets fell off. Production figures are available only through August. In 1957 182,988 tons from Etibank; 193,016 in same period of 1956. Plans were completed for re-treating chromite tailings and plans were being made at year's end to conduct geophysical surveys. Increased development of deposits in the eastern provinces is scheduled as they are considered most promising for the future. Deep exploration in those provinces and in the Isken-derun district was begun. The Kavak mine is to have a new shaft 400 meters deep.

The German firm of Krupp served as an iron and steel consultant for the Turkish government during 1957. Drilling for iron ore near Edremit was under way. The steel plant at Karabuk is to be enlarged by a German firm. The new iron ore mine near Simav in western Turkey was brought into production at a daily rate of 100 tons during the year. Ore output through August was 335,737 tons, an increase from 295,546 in same period of 1956.

Copper production for first eight months increased to 16,396 tons compared with 15,871 in the same 1956 period. However, the Ergani mine of Eti Bank closed in July so copper output for full year was down. Eti Bank conducted geophysical surveys in the Ergani area.

Newmont Mining Corporation discontinued its lead exploration at the old Balya lead mine during the year. Also terminated was the work of Turk Molibden Sirketi which had been organized to work the Gelemic deposit near Gelemic.

During the year prospecting for scheelite by private parties was closed in the Province of Bursa. However, MTA geologists prospected extensively with reported negative results. The large deposit at Uludag was scheduled to be brought into production by joint Turkish-West German interests but at year's end no work had been completed.

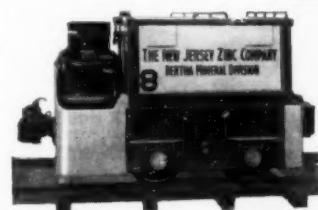
MTA made an important discovery of an estimated 7,000,000 tons of borax (colemanite) near Kuthaya early in the year while prospecting for lignite.

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EUROPE

AUSTRIA

The general situation in Austria's mining industry was more or less encouraging in 1957. Most mining operations increased production, especially the more important ones such as iron and magnesite. The latter added considerably to the nation's income.

Despite higher production figures than in the previous year, however, lead-zinc and copper suffered heavily from the tremendous price drop on the world market. Neither of these metals has ever been very profitable for Austria because of low-grade ores and comparatively small scale mining and processing operations.

Iron ore production for 1957 was 7.3 percent higher in 1956, and 23 percent higher than in 1955. This considerable increase in ore output was mainly due to investments (World Bank credit) and improvements in production methods. Low-grade ore is being treated in a new sink-float plant with a capacity of 400 tons per hour at Alpine Montan-Gesellschaft's Erzberg mine. A second smaller one is also in operation. Mild weather was extremely helpful since there is only open-pit mining there. Average daily production was 42,130 tons.

Steel production increased 20 percent to 2,504,000 tons, as compared with 1956. During 1957 this consisted of 338,000 tons of electric steel, 966,000 tons of Siemens Martin steel, and 1,200,000 tons of oxygen steel. These figures show a rate increase for the oxygen process of 41 percent over 1956. Within the last few years this new technique has obviously become the most important method of raw steel production in Austria.

Magnesite mining again moved upward. It was 8.2 percent above the 1956 figure and 16 percent above 1955. Magnesite is one of Austria's more profitable mining industries. Value of 1957 exports of magnesite and magnesite stones amounted to \$275,500,000.

Graphite, kaolin, and talc were also among the principal exports from the mining industry in 1957. The aluminum production shown on the table came largely from imported alumina as Austrian bauxite was not suitable for production.

Austrian Production of Metals and Minerals in Metric Tons In 1955, 1956, and 1957

Commodity	1955	1956	1957
Iron ore, total	2,838,450	3,257,887	3,495,721
Lead-zinc ore	176,519	163,119	182,845
Copper ore	158,639	152,826	165,177
Antimony ore	10,978	10,356	11,023
Bauxite	19,138	22,093	22,325
Gypsum + anhydrite	412,017	452,834	525,636
Graphite	17,814	18,685	18,921
Magnesite	991,709	1,083,635	1,172,598
Talcum	70,524	66,055	73,405
Kaolin	260,316	272,364	292,248
Lead, conc.	6,625	6,567	7,467
Copper, conc.	9,307	8,337	8,461
Aluminum	50,000	70,700	72,800

ERIE

In spite of the Income Tax Concessions granted by the Irish government to new mining enterprises, 1957 proved a disappointing year both in the development of new base metal mining properties and in the production from the operating ones.

St. Patrick's Copper Mines Limited, the wholly owned subsidiary of Irish Copper Mines Limited of Toronto, Canada, was unfavorably influenced in its production program by the fall in world copper prices and delays were experienced in the installation of the treatment plant. Underground development was maintained and commencement of production is expected late in 1958, at a rate of 4,000 tons per day of copper ore said to assay about 1.00 percent.

Explorers Alliance of Canada carried out a geophysical survey and diamond drilling of the old Bunmahon copper mines in County Waterford. Results were not sufficiently encouraging to warrant continuing exploration and the project was abandoned.

At the Glendalough lead and zinc mines in County Wicklow, Explorers Alliance through its subsidiary, St. Kevin's Lead & Zinc Mines Limited, carried out extensive underground development and exploration. Values encountered did not justify continuing work at the reduced prices for lead and zinc and the mine was closed.

A copper prospect at Hollyford, County Tipperary, which was diamond drilled was also abandoned during the year.

The Emerald Isle Mining Company, a subsidiary of the Can-Erin Mining Company, continued its examination of the Allihies copper mine in County Cork. As the dewatering of the extensive old workings has progressed, it is reported that underground surveys have indicated an improvement in the grade of ore in depth. A bulk sample of the ore has been sent to the United States for testing purposes.

The Abbeytown Mining Company Limited, operating in County Sligo, maintained production of lead and zinc flotation concentrates.

The Silvermines Lead & Zinc Company Limited continued production of lead flotation concentrates from the Shellee lead mine and crude barite from Ballynoe. The chairman reported that the directors of the Silvermines Lead & Zinc Company had received proposals from Cyprus Mines Corporation and Cerro De Pasco Corporation for the exploration of, and option to mine, the areas other than Shallee, over which the Company holds mining rights. Negotiations concerning these proposals are reported to be still in progress.

Because of the reduced metal prices, there was a decrease in production of lead and zinc concentrates during the latter months of 1957. Production of 70 percent Pb concentrates amounted to 2,900 tons, and 55 percent Zn concentrates amounted to 2,850 tons.

Gypsum Industries Limited at Kingscourt, County Cavan, maintained production of gypsum at approximately 133,000 tons for the year.

There was an increase in crude barite production over 1956 but figures are not yet available.

FINLAND

Production records in the Finnish mining industry continued to rise during 1957. Although no new mines reached the production stage, figures for the existing ones showed a substantial gain.

The Outokumpu Company continued the operation of its four mines at Outokumpu, Vihanti, Aijala, and Viojärvi. In addition, the company has undertaken the opening of a new mine at Leppävirta. Operation at this property will begin in 1959. Copper and nickel will be the two major metals to be recovered.

The vanadium plant of the Otonmäki Company was operating for its first full year at one half of its rated capacity. During 1957, the second series of pelletizing equipment, the second large furnace, and the necessary additional leaching apparatus were installed to bring the capacity up to the 1,000 tons of V_2O_5 per annum as planned. This equipment is now undergoing full-scale tests.

Otonmäki Company has purchased a magnetite ore body at Kärvasvaara in northern Finland. Operation will be started during summer 1958.

Development of the two undersea magnetite iron ore deposits was continued by Vuoksenniska Company. At Nyhamn, a shaft has been sunk to a depth of 296 meters. A drift is now under way from the shaft to the ore. At Jussaro, shaft sinking continues. This mine will become by far the biggest mine in Finland.

Three iron ore deposits have been located by Suomen Malmi Oy at Kolari in northern Finland near the well known Swedish iron fields. Although surveying has been only preliminary, some 50,000,000 tons of ore has been verified. It is possible that the deposits are much larger. The ore carries 30 to 40 percent iron as magnetite and hematite. The nearest railway terminal now is 90 kilometers and the nearest port Tornio 200 kilometers away.

Mine Production in Terms of Ores Milled, Minerals, and Metals Recovered by Finnish Mining Companies in Metric Tons for 1955, 1956, and 1957

Commodity	1955	1956	1957
<i>Outokumpu Company</i>			
Ore milled	1,104,702	1,221,395	1,387,668
Copper conc. ^{1,2}	104,175	100,409	122,239
Pyrite conc.	298,508	288,684	292,340
Zinc conc.	40,682	75,066	80,859
Lead conc.	1,353	2,650	4,489
Tungsten conc.	115	59	—
<i>Otonmäki Company</i>			
Ore mined ³	638,958	742,399	802,244
Ore milled ³	514,955	595,009	628,702
Magnetite conc.	184,474	206,168	209,783
Ilmenite conc.	84,974	102,915	105,749
Pyrite conc.	4,338	5,401	4,814
V_2O_5 (100%)	—	68.6	469.1
<i>Vuoksenniska Company</i>			
Ore milled	115,926	120,029	108,225
Gold ⁴	264	197	202
Copper conc.	2,085	1,576	1,915

1. Average Cu content for 1956 was 20.7 percent. 2. Average Cu in 1957 was 21.1 percent. 3. Difference between ore mined and milled is the lump waste separated in a magnetic cobbing plant. 4. Kilograms.

FRANCE

Although the rate of individual production was somewhat slower than in previous years, French mineral output was still satisfactory and showed an average increase of about eight percent in comparison with 1956. The worldwide drop in prices of nonferrous metals had its effect upon the French market. Offsetting this somewhat, a slight increase in the price of iron ore was observed.

Bauxite production increased during the year from 1,465,000 metric tons in 1956 to 1,685,000 in 1957. Lead increased from 13,000 to 17,000 tons, while during the same period zinc ore production remained stationary at 23,000 tons.

Antimony increased from 1,800 tons to 2,000 tons. French production of asbestos, principally from Corsica, rose from 8,500 tons to 10,200 tons. A slight reduction in bismuth brought output down from 64 tons to 54 tons in 1957.

Cadmium output was up, with 170 tons in 1957, and only 108 in 1956. A great reduction took place in cobalt with production dropping from 375 tons to 264 tons. Although the d'Alberetz tin mine produced 700 tons, it was closed down on December 31, 1957.

Increased activity in nickel brought 1957 output to 6,450 tons from the 1956 figure of 5,200 tons. Pyrite production increased from 305,000 tons of 324,000 tons. Fluorspar expanded from 81,000 tons to 90,000 tons. Talc rose to 141,000 tons from 132,000 in 1956.

A decrease in tungsten output was recorded with production dropping from 1,000 tons to 800 tons. Potash output remained about the same with 1,575,000 tons of K_2O in 1957, compared with 1,500,000 in 1956.

The increase in iron ore production was about 7 percent, or 57,800,000 tons, compared with 53,800,000 tons in 1956. During the same period, France produced 14,000,000 tons of steel, compared with 13,400,000 in 1956, amounting to a 4.4 percent increase.

FEDERAL REPUBLIC OF GERMANY

Mine production in the Federal Republic of Germany generally increased in 1957, except pyrite, and new post-war

Official Mine and Metallurgical Production Figures in Metric Tons for the German Democratic Republic For 1950, 1954, 1955, and 1956

Commodity	1950	1954	1955	1956
Iron ore	401,000	1,470,000	1,664,000	1,757,000
Copper ore	804,000	1,302,000	1,333,000	1,350,000
Potash salts ¹	1,336,000	1,463,000	1,552,000	1,556,000
Pyrites ²	41,000	47,000	49,000	54,000
Pig iron	337,000	1,318,000	1,517,000	1,574,000
Steel ingots	999,000	2,331,000	2,508,000	2,740,000
Sulfur (incl. by-product)	65,526	88,366	95,493	94,236
Alumina, calcined ³		41,118	46,239	54,988

1. K_2O equiv. 2. S content. 3. Al_2O_3 content.

highs were recorded for all products. The outlook for 1958 is not so good, since several mines, the most important one being the lead mine Gewerkschaft Mechnicher Werke, had to be closed because of low lead and zinc prices.

Smelter production of aluminum, lead, tin, pig iron, and steel further increased, while copper and zinc production declined. A new zinc smelter, erected by Duisburger Kupferhütte at Duisburg began production in December and will produce about 10,000 tons of electrothermic zinc (99.95 percent Zn) annually.

The general outlook for the non-ferrous metals industry, as well as for the iron and steel industry, is not too favorable, since demand has eased off, especially from abroad.

GERMAN DEMOCRATIC REPUBLIC

For the first time, a few official figures have been released for mining and metallurgical production in the German Democratic Republic. These figures cover the years to 1956 only.

Of the copper ore produced in 1956, about 1,000,000 tons came from the old Mansfeld mines and about 300,000 tons were produced from the new mining field near Sangershausen. The copper content

of the Mansfeld ore is only 1.1 to 1.3 percent, compared with 2.4 to 3 percent before the war. The Sangershausen ore has higher copper contents. The total content of the copper ore produced in 1956 is estimated at 18,000 to 19,000 metric tons.

About 6,100 to 6,400 tons of lead in concentrates is produced annually. In addition, about 3,000 tons of lead is recovered from flue dusts from the Mansfeld smelters, making a total of 9,000 to 9,500 tons mine production of lead annually.

The annual production of zinc in concentrates is about 3,500 to 4,000 tons. This concentrate is reserved for the electrolytic zinc plant, being erected near Freiberg. The total reserve of concentrate is estimated at 22,000 to 25,000 tons zinc content. So far only a pilot electrolytic zinc plant with a monthly output of 150 tons is working at Freiberg. According to one report, the electrolytic zinc refinery is to start production in 1959 with an annual output of 10,000 tons. Another source says that the electrolytic refinery will not be working before 1961, but with an annual capacity of 15,000 tons.

The nickel ore reserves near St. Egidien are estimated at 40,000,000 tons averaging 0.8 to 1.0 percent Ni. Ore is to be treated by the Renn-process producing "Luppen," containing 8 to 9 percent Ni and 90 percent iron. From the "Luppen," pure nickel with 99.6 percent Ni will be produced by a further process. The direct use of the "Luppen" by the steel industry has so far been unsuccessful, because of the high phosphorus and sulfur content. The plant to be erected shall be sufficient to cover the total demand for nickel in Eastern Germany in 1962.

Furthermore, about 700 tons tin in concentrates, 200 to 250 tons tungsten concentrates, and 250 to 300 tons arsenious concentrates are also produced in Eastern Germany.

The antimony mine near Oberböhmisdorf has been idle since the beginning of 1955. Ore reserves are estimated at 1,000 tons antimony.

GREECE

The Greek mining industry continued to make rapid strides during 1957. Modern mining in Greece dates only since 1950 when rehabilitation of plants destroyed during World War II was completed and modern prospecting and mapping was started. The mine production table shows how metal output has doubled since 1953.

Bauxite production for 1957 amounted to 800,000 metric tons. During the period 1953 to 1957 production was more than doubled. As a result of investigations recently carried out by the Greek Institute of Geology and Subsurface Research, the visible bauxite deposits have been estimated at 85,000,000 metric tons. It is

Mine Production in the Federal Republic of Germany in Metric Tons for 1951, 1952, 1953, 1954, 1955, 1956, and 1957

Commodity	1951	1952	1953	1954	1955	1956	1957*
Lead ore ¹	50,700	51,700	63,000	67,700	68,100	66,300	71,900
Zinc ore ^{1,2}	101,900	106,900	116,100	120,700	120,200	121,800	126,400
Copper ore ²	2,100	2,700	2,500	2,700	2,000	1,700	1,800
Pyrites	572,038	571,300	561,727	601,460	643,300	646,900	610,000
Iron ore, crude weight	12,926,000	15,413,000	14,622,000	13,037,000	15,684,000	16,928,000	18,320,000
Iron ore, iron content	3,473,000	4,102,000	3,899,800	3,551,000	4,226,000	4,512,000	4,827,000
Potash salts crude weight	10,847,600	12,585,100	12,586,400	15,755,700	16,106,400	15,544,000	16,200,000
Potash salts, K_2O content	1,323,300	1,553,700	1,577,000	1,935,600	2,019,600	1,965,400	1,986,000
Salt (rock and evaporated)	2,757,300	2,576,000	2,874,000	3,126,000	3,384,000	3,581,000	3,588,000
Graphite	10,304	8,411	7,108	9,112	10,463	11,620	a
Fluorspar	140,390	146,570	161,224	173,196	154,962	146,358	a
Barite	388,836	285,322	303,383	383,367	414,321	407,214	a
Bauxite	5,381	7,186	7,848	4,220	3,875	4,894	a
Gypsum	468,700	587,263	641,200	631,502	713,135	726,766	a
Feldspar	98,231	102,909	95,701	126,385	166,224	166,815	a
Soapstone	—	12,045	11,892	16,527	18,000	18,143	a
China, clay	—	—	—	314,194	350,249	350,696	a
Fuller's earth	—	—	—	179,799	216,046	244,359	a

* Preliminary. 1. Recoverable metal content. 2. Including recoverable zinc content of pyrite. 3. Not available.

Smelter Production in Western Germany in Metric Tons For 1952, 1953, 1954, 1955, 1956, and 1957

Commodity	1952	1953	1954	1955	1956	1957 ¹
Aluminum	100,474	106,940	129,219	137,066	147,362	153,838
Lead (incl. lead produced by battery manufacturers)	135,473	147,025	147,677	147,426	161,005	177,341
Copper (refined)	187,706	211,677	234,291	239,733	233,525	253,389
Zinc (excluding dust)	150,804	150,619	169,339	179,969	190,630	185,407
Tin (unallied)	1,442	1,574	1,355	1,420	1,727	2,081
Tin alloys	3,088	2,670	3,781	4,417	4,178	3,100
Solder	5,676	7,522	8,768	8,975	10,173	10,279
Pig iron	12,877,000	11,654,000	12,512,000	16,482,000	17,577,000	18,358,000
Steel ingots and castings	15,806,000	15,420,000	17,434,000	21,336,000	23,189,000	24,507,000

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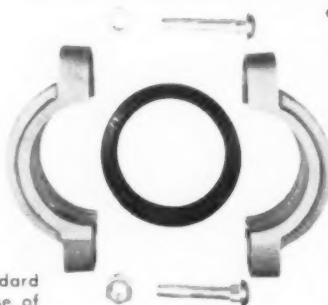
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Europe

hoped that further investigation will prove the existence of much larger deposits.

Since 1955, a Krupp-Renn furnace has been in operation treating lateritic nickeliferous iron ore; processing 120,000 metric tons. It produces iron pellets with 4.5 percent Ni + Co. Another plant for further processing the iron pellets to produce 20,000 to 25,000 tons of ferronickel, 8.5 to 9 percent Ni + Co, will start operating in 1958.

During the last two years, five ore dressing and flotation plants for low grade chromite, manganese, lead, zinc, etc., started operations. In the last two years, 1955-1957, new mining activities were started by American mining companies, such as Asbestos Exploration (Kennecott Copper Corporation) undertook the exploration and development of a large open pit for the production of 2,000,000 to 3,000,000 annual tons of 3 to 4 percent chrysotile ore, as well as the erection of a 40,000 to 80,000 ton mill. Already 200,000,000 tons of asbestos bearing serpentine has been proved and a large pilot plant has been operating there successfully for a year. It is estimated that Kennecott's capital investment will reach \$12,000,000.

Another American company, the Dresser Industries, Dallas, Texas is engaged in barite mining at Myconos Island, its production having reached 84,000 tons in 1957.

The Austrian firm, Oestereich-Amerikanische Magnesite Company Rodenstein, in cooperation with the American firm—Basic Refractory Company in 1957 started the operation of a furnace for the preparation of 20,000 tons, per year, of dead burned magnesite from the large and high grade magnesite deposits of Greece.

Moreover, small quantities of iron ore, alluvial gold, perlite, kaolin, bentonite, and natural corundum (emery) are also produced in Greece.

The Greek government Development Program provides for the establishment of a metallurgical industry to produce aluminum metal (annually 50,000 metric tons) and pig iron (200,000 metric tons), ferrochrome, ferromanganese, and ferrosilicon. The ore deposits necessary for these industries have been located.

Mineral Production of Greece in Metric Tons for 1938, 1953, and 1957

Commodity	1938	1953	1957
Barite	32,997	25,459	137,239
Bauxite	147,265	330,749	820,000
Chromite	35,661	36,759	100,000
Iron ore	308,535	86,326	427,651
Nickel-iron ¹	—	—	125,000
Manganese	3,065	13,451	45,000
Pyrite	202,238	225,134	280,817
Lead conc.	—	6,460	14,316
Zinc conc.	12,658	11,157	23,640

1. Contains 2.0 percent Ni + Co.

ITALY

In general, Italian mine production was larger in 1957 than in 1956. The exceptions were in iron and antimony ores.

A pyrite orebody, estimated at about 1,000,000 tons, was discovered in the Rigoluccio area of the Gavorrano mine, near Grosseto by Montecatini Company. Another, larger pyrite-magnetite deposit is still under exploration at Monte Argentario by Ferromin Company in the Grosseto district.

Europe

In the old Vallimperina mine, near Udine (Montecatini Company), already considered almost exhausted, about 500,000 tons of additional ore were found. In the "Vigolzano" lease (Piacenza), a lens of pyrite (with 1.5 percent copper) of more than 300,000 tons was found.

In the large pyrite mines of the so-called Maremma group (Western Tuscany), several dressing plants have been improved: at Boccheggiano (Montecatini Company) the capacity of flotation plant has been doubled; a new ore dressing plant was installed at the Ravi mine; and the hydro-gravimetric ore-washing plant of Niccioletta (Montecatini Company) was also improved. In the latter mine, a new ventilation shaft was also completed.

Total lead and zinc production was increased during 1957; in the last months, however, there was some decrease. At year's end, Italian lead and zinc mining industry is entering a critical position because of the expected gradual reduction of duty-protection foreseen by the European Common Market agreement.

In the Accesa-Serrabottini mine (Grosseto district), production was increased by the doubled capacity of the flotation plant (600 to 700 tons of ore per day). In the Argentiera mine near Belluno (Soc. Mineraria del Cadore), production began again by open pitting. Ore is treated by a new flotation plant. In the same district, underground exploration in the Salafossa zone (San Marco Company) discovered a remarkable deposit. In the Milan district, the exploitation of Zuc di Valbona mine was started with favorable forecasts.

In Sardinia a new flotation plant (70 tons per day capacity) was installed at the Mon'Ega mine; a sink and float section was installed at the Campo Pisano mine (Soc. Mineraria Sarda) to treat the pyrite-sphalerite-dolomite ore found in lower levels of the mine.

The largest portion of Italian mercury production came from the Abbadia S. Salvatore mine (Monte Amiata Company). 1957 output of this mine also increased through improvement of the mining hoisting plants and the installation of modern metallurgic (Gould) rotary furnaces. Presently two new furnaces, built in Italy, are being assembled at the mine. In the Mount Amiata area, a wide exploration program was started in 1957, and includes geophysical prospecting (gravimetric and seismic methods).

An experimental Roma furnace was installed at the Gibellini sulphur mine (Agrigento); and two Gualtieri furnaces at the Gessolungo and Pagliarello mines (Enna). In the Bologna district the sulphur ore output remained, during 1957, the same as in 1956. A deposit of more than 400,000 tons was found in the Case Morollo area (Forli). In the Comero mine (Strongoli e S. Nicola dell'Alto, Calabria) two four-cells Gill furnaces were renewed and a grinding plant was installed for production of the so-called "ventilated ore"; underground, cutting of a lower level outlined the existence of further ore reserves.

Intensive exploration for uranium was carried on in 1957. Particularly worth mention are the results of prospecting in the Cuneo zone (Piedmont), in Val Gardena sandstones, and in Sardinia.

Iron production slightly decreased during 1957; important innovation of last year is the renovation of the old magne-

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**Italian Metal and Mineral Production in Metric Tons
in 1951, 1952, 1953, 1954, 1956, and 1957**

Commodity	1951	1952	1953	1954	1956	1957
Bauxite	174,014	282,912	248,947	295,082	259,712	261,111
Antimony ore	4,537	4,478	2,343	1,973	1,537	677
Iron ore	552,855	790,237	991,294	1,065,183	1,594,769	1,565,117
Manganese ore	52,721	81,190	78,384	76,310	46,015	47,002
Mercury ore	—	—	197,498	232,055	343,588	364,717
Lead conc.	64,375	64,665	66,219	69,123	81,825	87,046
Zinc conc.	212,822	234,411	223,928	240,686	247,617	265,525
Copper conc.	—	—	1,046	4,166	2,118	1,849
Asbestos fiber	22,612	23,941	20,281	23,546	30,753	34,287
Barite	76,541	56,274	71,762	71,898	92,334	99,290
Fluorspar	41,019	59,125	75,790	77,148	124,208	144,165
Pyrite	898,186	1,141,417	1,234,566	1,231,700	1,308,591	1,469,577
Sulphur	214,340	236,439	223,061	204,040	195,208	194,340
Talc	75,996	80,336	80,282	—	92,852	91,766
Aluminum metal	49,751	52,830	55,463	57,572	63,409	66,500
Lead metal	36,000	34,931	37,944	37,331	39,116	39,400
Zinc metal	47,409	54,851	60,068	66,800	73,560	74,400
Mercury ¹	53,800	57,740	51,330	54,430	2,135	2,200

1. Flasks.

tite mine of San Leone, in Sardinia. The Ferromin Company was granted the concession in 1950, and in the same year began systematic exploration. Several million metric tons of ore were discovered; grades vary between 25 and 40 percent iron (magnetite). A new concentration plant was installed; presently, this plant (which includes dry and moist magnetic separation sections) has a capacity of 2,000 metric tons per day.

LUXEMBOURG

Mining activities within the country are limited to iron ore. The oolitic hematite ores or 'minette' occur in the basins of Esch and Differdange, bordering France, and constitute part of the famous Lorraine iron ore deposits.

Iron and steel exports comprise 94 percent of the total export value of the country. Luxembourg has the highest per capita steel production in the world, 11.6 metric tons, and has a world rank of eighth in steel production.

Increase demands for steel mean that more crude ore must be imported, and within the past five years, the quantity imported has doubled. Most imported ore comes from France, whereas most of the exported crude ore goes to Belgium. Germany is becoming an increasingly important customer for crude ore; exports to that country rising from 90,190 metric tons in 1954 to 576,450 metric tons in 1957.

Three companies are engaged in the iron-steel industry: (1) Société Anonyme Acières Réunies de Burbach-Eich-Dudelange (ARBED). (2) Société Anonyme des Hauts Fourneaux et Aciers de Differdange, St. Ingebert-Rumelange (HADIR) and (3) Société Minière et Métallurgique de Rodange.

**Luxembourg Iron-Steel Statistics
in Metric Tons**

Item	1956	1957
Iron ore extracted	7,594,000	7,843,000
Iron ore imported	5,339,000	5,479,000
Iron ore exported	1,844,000	1,652,000
Cast iron production	3,316,000	3,368,000
Steel production	3,456,000	3,493,000

NORWAY

Mine production volume and value were at the same level as the record year 1956, but the future outlook is not as bright. The sulphide ore mines which account for better than half the production value are hit by the low copper and

zinc prices and the limited demand for pyrite. Pyrite production in Europe has been expanded materially in the last years, and, at the same time, native sulphur has taken over part of the market. Some Norwegian sulphide mines have decreased production, and more cuts are expected.

The iron ore mines which are first in production volume and second in value, are in better shape and expect continued expansion of their production. Their high-grade concentrates are in demand by the many sintering plants built in Europe during the last decade, and the prices have been kept on the same level for this year's contracts. A couple of old lump iron ore mines have been reopened on a small scale with favorable results.

Two new concentrating plants were put in operation in 1957. Bleikvassli in north central Norway is treating 300 tons a day lead-zinc-pyrite-ore by selective flotation; Gravalid in western Norway, 50 tons a day of cupriferos pyrite by bulk sulphide flotation; Orkla sulphide mines has expanded their sink-and-float section with another Swenson shaking-trough separator.

A/S Titania has broken ground on a 1,000,000-ton-a-year project for the extensive ilmenite ore deposit at Telnes. The schedule is for production in 1960. Rana Gruber is building a 10-ton-an-hour pilot plant to test flotation flowsheets for its low-grade iron ore deposits. Roedsand Mines has embarked on a program for tripling iron concentrate production. Sulitjelma Mines has announced plans for replacing the old flotation plant, the largest in Norway.

Prospecting, geological, and geophysical exploration and diamond drilling have been carried on at a brisk pace. Most of the efforts have been made in

the northernmost part of Norway. Large-scale investigations have disclosed considerable amounts of copper ore both at Kautokeino and at Repparfjord, and the work will be resumed this summer. In southern Norway, the Fosdalen mine has reported the discovery of an extension of magnetite ore at greater depth, and the Follfald mine is exploring a promising sulphide ore about 20 miles from present operations.

PORTUGAL

1957 brought a sudden decline in Portuguese mining activities. Production and value both dropped below the average amount of the last 20 years (7,500,000 tons of raw materials, and escudos 450,000,000, respectively). The chief cause was the decrease in price of some metallic ores, particularly sharp for tungsten, and accentuated in lead, zinc, and pyrite.

The country's important tungsten mines were caught by the unexpected price reductions and steadily declining market. The Portuguese government is now studying the possibilities of subsidizing production to aid these mines.

Nevertheless, 3,500 tons were produced in 1957, equalling about 75 percent of the 1956 output. During the last three months of the year, production was virtually nil. The only work now being carried on is that of maintenance. In a few mines some treatment of tailings is continuing just to keep the staff occupied.

The crisis in the pyrite mines was not so grave, but the situation is far from satisfactory. The country's position as a major supplier of sulphuric acid is especially threatened by the increasing use of native sulphur. These pyrite deposits were still being worked last year: Louzal at Grandola, Setubal; S. Domingos at Mertola, Beja; Aljustrel at Aljustrel, Beja. The positive results of the geophysical prospecting program of the Mining Development Bureau were confirmed, adding to the country's pyrite reserves.

Operations were fairly normal in mining the country's cassiterite deposits. The alluvial deposits at Beiras-Macinhães, Belmonte, and Guardal, and the vein deposits of Tuela (Vinhais, Bragança), Lagares (Satao, Viseu) Montesinho (Bragança) and others produced 1,150 tons, or approximately 65 percent of the 1956 output. The alluvial deposits are steadily decreasing, while the vein deposits appear to have a long life ahead, especially the Montesinho which is just getting under way.

Because of the tungsten crisis, many tungsten firms are exploring for cassiter-

Norwegian Production of Metals and Minerals in Metric Tons in 1953, 1954, 1955, 1956, and 1957*

Commodity	1953	1954	1955	1956	1957*
Iron ore conc. ¹	1,186,293	1,094,577	1,255,584	1,513,683	1,505,000
Ilmenite conc. ²	128,113	149,185	157,833	190,503	210,000
Pyrite ore and conc.	744,856	794,914	843,776	863,000	850,000
Copper conc. ³	24,763	26,375	26,672	27,932	29,000
Zinc conc. ⁴	11,122	11,230	14,001	13,267	15,500
Lead conc. ⁵	874	1,124	1,070	1,221	1,300
Molybdenum conc. ⁶	258	265	288	300	300
Columbian conc. ⁷	564	178	320	260	300
Graphite conc. ⁸	2,953	3,622	5,416	5,000	5,670
Pig iron (electric)	58,844	59,920	123,332	180,000	N. A.
Aluminum	56,198	64,101	71,760	92,690	N. A.
Copper	12,104	12,891	13,737	15,180	N. A.
Copper Skjaerstone (33% to 35% Cu)	13,246	12,494	13,710	13,391	N. A.
Zinc	38,798	44,461	45,519	48,636	N. A.

* Estimated. N. A. Not Available. 1. Aver. 64.5% Fe. 2. Aver. 44% TiO₂. 3. Aver. 21% Cu. 4. Aver. 49% Zn. 5. Aver. 66% Pb. 6. Aver. 96% MoS₂. 7. Aver. 50% CbO₂. 8. Aver. 80% C.

SWEDEN

ite, Panasqueira is presently exploring some of the tin mines at Vale da Ermida and Argemala in Castelo Branco which were practically abandoned until recently.

The Minas de Jales (Vila Pouca de Aguiar, Vila Real) continues to be the only real source of gold. Output for the year was about 627 kilograms, approximately 8 percent more than in 1956.

The Fragas da Carvalhosa (Moncorvo, Braganca) is still the only iron mine being explored. Its output in 1957 was about 190,000 tons, or about 12 percent more than in 1956. At the Vila Cova magnetite mine, installation of steel making equipment is continuing and almost ready to go into operation. The firm exported concentrate containing 63 percent Fe. The Orada magnetite mines (Serpa, Beja) produced 90,000 tons in 1957.

Mineral and Metal Production in Portugal in 1956 and 1957 In Metric Tons

I—Ores	1956	1957
Amianthus	32	58
(a) Arsenopyrites	3,906	7,601
(a) Arsenopyrites auriferous and argentiferous (raw concentrates with 150 gr/tons Au and 390 gr/tons Ag)	4,589	4,763
Barite	314	569
Beryllium (11% OBe)	221	168
Sphalerite	1,136	303
(b) Cassiterite (65% Sn)	1,768	1,521
(b) Cassiterite and ilmenite (mixed 25% Sn, 17% TiO ₂)	21	44
(b) Cassiterite and wolframite (mixed 25% Sn, 25% WO ₃)	1	486
Columbite and tantalite ..	27	13
Copper Ores (25% Cu) ..	803	5
Copper precipitated (62% Cu)	114	112
(c) Galena (60% Pb)	2,064	2,073
Hematite	163,025	182,080
Ilmenite (35% TiO ₂)	616	304
Kaolin	48,934	47,582
Magnetite	74,465	101,601
Manganese ores (42% Mn) ..	3,182	5,272
Molybdenite	11	15
(d) Pyrites	669,776	667,308
Scheelite (65% WO ₃)	246	293
Scheelite and cassiterite (mixed 25% WO ₃ , 25% Sn) ..	136	160
Stibnite	—	20
Talc	86	—
(e) Wolframite (65% WO ₃) ..	4,313	3,344
II—Products from treatment of ores		
(a) Arsenious anhydride (97/99%) ..	906	724
(b) Tin metal (99.5%)	1,145	998
(c) Lead metal (99.8%)	851	552
(d) Copper concentrates (8%) ..	9,202	10,883
(d) Sulphur	17,194	16,943
(e) Ferro-tungsten	346	266

Obs.—1—The II only includes the production of ore dressing plants, with the exception of tin metal, which is the total production for the whole country. The minerals that gave origin to these products are included in I.

2—The numbers mentioned in 1957 are subject to ratification.

SPAIN

Spanish mining in 1957 featured increased production; especially iron ore and mercury.

Iron mining was very active to supply the new steel plant siderurgica de Aviles as well as other expanding plants. Total iron ore used was 6,700,000 metric tons of which 1,400,000 were imported from Morocco. The Coto Wagner firm at Ponferrada produced 465,000 tons with plans for eventual expansion to 1,000,000 annual ingot tons.

Mercury exports were 47,931 flasks compared with 45,546 in 1956. However, actual production was far greater than in 1956 and can be expanded further as the Almaden mines continued new installations and worked on the Nos. 16 and 17 shafts.

Production and shipment of pyrite expanded slightly from the 2,307,530 tons of 1956. Germany continued to be the largest importer of pyrite and calcined pyrite.

Lead production was 61,286 versus 61,174 in 1956. However, at year's end lead mining was curtailed as prices fell. Blister copper output at 6,500 tons was unchanged. Metallic zinc output fell with the price to 21,700 tons. Zinc concentrate production was 140,000 tons.

Other mineral and metal production was 770 tons of tin; 16,000 tons of aluminum as new plants came into operation; 970 tons of wolframite; 1,411 tons of silver; and an increase in manganese to 38,000 up from 31,460 in 1956.

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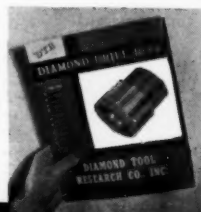
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Production and Export of Swedish Mineral Products in Metric Tons for 1953, 1954, 1955, 1956 and 1957

Commodity	1953		1954		1955		1956		1957	
	Production	Export	Production	Export	Production	Export	Production	Export	Production	Export
Iron ore	17,130,000	14,553,000	15,416,000	14,083,000	17,450,000	15,654,000	19,075,000	17,290,000	20,035,000	47,467,000
Pyrite	386,291	12,000	398,235	10,448	391,561	15,781	489,119	55,328	498,853	101,138
Lead conc.	33,954	8,346	40,372	10,110	43,870	12,982	46,085	15,332	50,712	18,006
Zinc conc.	78,583	76,393	103,335	110,356	104,557	105,074	117,166	127,746	118,720	138,007
Copper conc.	52,679	—	53,476	—	67,163	—	69,232	—	76,996	—
Tungsten conc. ¹	440	—	450	—	458	—	450	—	505	—
Fluorspar	—	—	—	—	—	—	1,000	—	2,600	—

1. 60 percent WO₃.

As of October 1, the Swedish state took over the main part of LKAB-Loussavaara-Kiirunavaara AB—which means that TGO's—Trafik AB Grängesberg-Oxelösund's—54-year activity at the Lappland mines came to an end. Kiruna, Malmberget, and Koskullskulle have become one administration unit, separated from TGO's mines in central Sweden—Grängesberg, and Strassa.

At Malmberget the new sorting plant was finished, and the building of a new beneficiating plant commenced. It will have an annual output of 600,000 tons of iron concentrate. Four new shafts are planned and the sinter plant will be extended for an annual production of 350,000 tons of pellets.

At Kiruna work at the central plant continued with increased machine installation, shaft sinking, and extension of the ore-stationyard to cover 18 tracks. The output of iron ore, estimated at 10,300,000 tons during 1958, will be 12,000,000 tons in 1962. In the Svappavaara and Leveäniemi fields, investigations were carried out under the management of SGU.

At Grängesberg, sublevel caving is gradually being replaced by block caving. On the new 400-meter transport level, the ore is transported by Malmberg cars of 7 cubic meters capacity, then are emptied during motion. In the stopes loading is carried out by LM 100 machines into 2 cubic meters Granby cars.

At Strassa, where the annual output will amount to 430,000 tons of iron concentrate, the new shaft will be sunk to 150 meters. A concrete shaft tower, 48 meters high, was built which will contain a Koepe hoist for one skip and one man cage, both with counterweights. The sorting and beneficiating plants have been projected and the new sinter plant is being planned to have an annual production of 150,000 tons of pellets.

At mines in Kiruna, Tuolluvaara Gruv AB will increase production in 1961 to 570,000 tons, of which 140,000 tons will be concentrate. In order to increase ore hoisting in the central shaft, a new man shaft will be sunk to a depth of 500 meters. A shaft tower and a crushing mill will be built for treating breccia ore. By installation of wet separators and vertical filters it has been possible to increase the recovery, and, at the same time, reduce the moisture in the concentrate to 5 percent.

Stora Kopparbergs Bergslags AB is building a new plant to concentrate iron ore at Grängesberg for an annual production of 300,000 tons. A new shaft head-frame was erected, and the new hoisting plants will be used in 1958.

At Tuna Hästberg, Bergslaget has sunk the shaft to the final depth of 550 meters, and in the new shaft tower a Koepe hoist for double-skip and single-passenger hauling is being installed. The new plant which is estimated to yield about 100,000 tons of manganiferous iron ore in size 0 to 6 millimeters yearly, is already in use.

In order to uncover further ore-bearing areas at Blötberget a surface rock tunnel, 1,370 meters long, is being driven to divert river water; two rock tunnels totaling 1,760 meters in length will be used for draining and to transport waste water.

At Ickorrbotten and Källbotten near Ludvika, AB Statsgruvor has built new shaft towers. The new plant at Hälsberg which is estimated to yield 250,000 tons of iron concentrate yearly, and which will have a flotation department for hematite ore, is calculated to start at the beginning of 1958. The central shaft and the shafts at Ickorrbotten and Källbotten are being sunk to depths of 400, 325, and 300 meters, respectively.

At Norberg, AB Statsgruvor has completed the new 65-meter-high concrete shaft tower at the Mimer field which will contain Koepe hoists for a skip and a man cage, each with a counterweight. At 275-meter and 800-meter, transport levels are being driven to transport ore from the Prost and Stor mines to the new sorting and beneficiating plant at Mimer. It will have an annual capacity of about 35,000 tons of lump ore and 140,000 tons of iron concentrate. The new plant is scheduled to be in operation in 1960. During 1957 two-stage treatment using the Svensson heavy density process was introduced. The result was good.

Norbergs Grufförvaltning is building a new plant at Lake Bålsjön at Norberg which is estimated to yield 250,000 tons of lump ore and 200,000 tons of iron concentrate yearly. For the continued planning of the plant, experimental work is getting started on flotation of hematite. The pilot plant has an hourly capacity of 20 tons. The problem of hematite flotation has been solved, but experiments are continuing to get increased tonnage, further reduction of the phosphorus percentage, and to have the economical conditions made clearer. The conveyor heading which will start from the central mine at 350-meter depth to the mill will be 1,150 meters long, with an inclination of 18°. At 250-meter depth, the headings totaling 2500 meters in length from five caving blocks to the central mill, had been driven about 2,000 meters by year's end. The Gustaf Adolf shaft is being sunk to the depth of 300 meters, where the future transportation system will be located.

Surahammars Bruk started its new crushing mill at the Kallmora mine in Norberg. The plant calculated to receive 250,000 tons of ore yearly. Plans are being made to build a beneficiating plant which is to correspond in size with the ore delivered from the crushing mill. During the year a schlagbrecher-plant was installed at the 250-meter level.

In Vingsbacke, owned by SKF Hofors Bruk, mining started to the utmost limit with 6-meter-wide stopes and 11-meter-wide pillars which later are being taken out by long-hole blasting. The annual production is scheduled for 80,000 to 100,000 tons of iron concentrate.

In the Moss mine in Västmanland, the new dressing plant started an estimated annual production of 50,000 tons of magnetite concentrate. Knuts shaft has been sunk to the depth of 350 meters.

At Bispgberg the ore in the Bispgberg field indicated on surface by magnetic measurements has been investigated at a depth of 520 meters; it has been found that the ore occurs in two parallel veins. One of them which is 440 meters from surface has been followed for 500 meters and shown a width of 5.5 to 6.0 meters. The other vein has been cut off after 520 meters through a displacement. The investigation work is going on along with the development work in the big vein.

Regarding sulphide ores, SGU found during the year that the iron pyrite deposit with copper and zinc at Stekenjokk in Norrbotten contains 4,000,000 tons.

As of January, 1958 AB Zinkgruvor, owned by Bolidens Gruv AB, has become a special administration unit of the main company. The main office for the Zinkgruvan department is to be situated at Garpenberg.

The Boliden Company reports that the mining at Långeselegruvan during the year reached production capacity estimated to yield 200,000 tons of zinciferous pyrite ore yearly. The ore is transported by standard gauge railway underground to the central works at Boliden. The Akulla mine has been abandoned as depleted.

At Kristineberg, a new shaft tower was built at the new central shaft, and in the Adak district pilot plant was started at the copper deposit of the Brännmyra mine. Laisvall lead ore mine reached an annual production of 500,000 tons. A railway, about 2 kilometers long at a depth of 100 meters under lake Laisan, connects the two mining fields. Investigation of the Lövsstrand mine in the parish of Dorotea has been temporarily suspended.

UNITED KINGDOM

There has been little change in the mining position during the past year although the fall in the price of lead and zinc has been reflected in profit and in the amount of exploration being undertaken.

It is estimated that the output of pig iron and steel ingots in 1962 will be 20,000,000 and 29,000,000 tons, respectively. This calls for an enormous increase in supplies of both domestic and imported ore, while the financing of a five-year development program involves something like £600,000,000. Tonnage of iron ore in 1956 was about 16,200,000 tons and it is estimated that by 1962 it may be expanded to 23,000,000 tons.

The largest walking drag-line in the world, weighing 1,675 tons and equipped with a 282-foot tubular jib, was put to work in September. It has a 20-cubic-

Europe

yard bucket and dumps 260 feet away at a height of 120 feet above the working level.

The fall in base metal prices has not encouraged further prospecting. The annual report of South Crofty Mine, producing tin in Cornwall, published in May 1957 showed a profit of £20,032 compared with £37,861 in the previous year. Since that time, the directors have issued the results for nine months operations, which indicate that due to increased working cost and the fall in the tin price, the estimated revenue of £272,600 is slightly below the expenditure at £277,700.

During this period, a great deal has been spent on modernizing much of the plant. Part of the new flowsheet in the table section of the plant was put into operation at the end of August and the heavy media separation plant should be running fairly early in 1958. Production has been increased somewhat, about 720 tons being sold.

Geevor Tin Mines Ltd., the only other major tin mine in Cornwall, has continued to provide good returns and in the accounts published at the end of August, a profit of £102,670 was shown before taxation which was slightly higher than in the previous year. The tonnage of ore milled was about 7,900 tons higher although the grade was slightly lower. Development was well maintained, however.

A new flotation section was put into operation during the year involving re-grinding and scavenging both the froth and table flotation, concentrates being the sulphide rejects made in dressing the tin ore. As a result, a considerable reduction has been made of the tin content of this sulphide and operating costs reduced. The final sulphide product contains a considerable copper content and is sold as a byproduct. 693 tons of concentrate were sold in 1957.

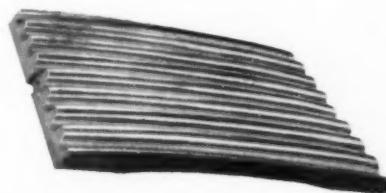
The new plant of Hydraulic Tin Ltd at Bissoe, Cornwall, designed to recover tin from accumulated tailing material, was put into operation in the early autumn. The new flowsheet involves washing, screening, concentration on Humphreys spirals for sand with Buckman tables for the finer material. Final cleaning is by flotation for sulphide removal and magnetic separation.

The small wolframite mine at Hawkswood, now owned by the Pena Copper Company, continued production on a small scale during the year, but all production ceased from Great Western Ores wolframite mine at Castle-an-Dinas. This company was a subsidiary of South Crofty Ltd.

No new developments in lead mining can be reported. Existing mines, namely Park mine at Llanwrst in North Wales, Halkyn mine in North Wales, and Green-side mine, near Lake Ullswater in Cumberland, are still operating on much the same level as in 1956.

The report for Halkyn United Mines published in July showed a lower profit of £45,300 compared with £65,426 in the previous year although 34,716 tons of ore were milled, but the grade was lower. The lead sold amounted to 2,748 tons, almost the same as in the previous year but the amount of zinc concentrate fell to only 454 tons. Development was disappointing, so that there was a further reduction in the calculated ore reserves, although they are still sufficient to maintain current output for three years without any further additions.

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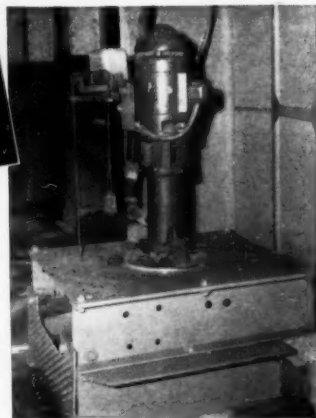
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Europe

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Commodity	1939	1951	1952	1953	1954	1955	1956	1957
Iron ore	666,813	581,352	676,010	794,917	1,110,743	1,398,298	1,724,967	1,876,116
Pig iron	101,000	248,000	272,884	269,748	356,000	513,797	630,574	714,271
Steel	235,000	434,000	442,354	514,537	616,298	806,023	886,730	1,049,286

Metric Tons of Ore Mined in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, 1956, and 1957

Ore	1939	1951	1952	1953	1954	1955	1956	1957
Lead-zinc	274,772	1,118,590	1,203,764	1,432,100	1,484,522	1,650,178	1,726,461	1,763,937
Copper	983,902	1,173,199	1,264,998	1,343,563	1,298,860	1,476,863	1,740,855	1,953,134
Antimony	18,963	55,088	74,594	61,450	75,258	80,474	83,056	85,547
Bauxite	718,594	453,357	577,196	462,309	680,597	791,057	881,418	888,240
Chromite	44,852	99,639	107,222	126,961	124,480	126,207	118,762	120,266
Manganese	5,656	12,868	N.A.	N.A.	N.A.	10,955	11,573	10,234
Pyrite conc.	78,064	113,541	N.A.	N.A.	N.A.	226,682	255,947	312,600

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The Lowland Company's mine at Wanlockhead, Lanarkshire, started its treatment plant and is now milling old dumps, accumulated tailing, and some development ore.

YUGOSLAVIA

1957 was a year of full capacity production for Yugoslav mining. The output of several metals was the highest on record.

Lead and zinc ore production remained on the basis of 1956, but metal output increased. In comparison with 1939, and 1957 production of lead was nearly eight times higher and that of zinc six times higher. Where previously nearly half of the zinc concentrate was exported (32,327 tons in 1956), now the electrolytic zinc plant at Sabac converts most of it to metal and sulphuric acid.

The lead production of the Trepča smelters (Kosovo) was 65,221 tons of refined lead (63,216 tons in 1956) from several mines in Kosovo, Serbia, Macedonia and Montenegro. South of Trepča, the new Kišnica mine is being developed to a capacity of 150,000 tons of ore per year, containing 5 percent Pb and 1 percent Zn. In East Bosnia the Srebrenica mine is able to produce 100,000 tons ore per year, containing 5 percent Pb and 7 percent Zn. The Koprivč-Kopaonik prospect northwest of Trepča is also very promising. Trepča is planning the retreatment of the flotation tailings for their contents of sulphur, iron, and manganese, and of the smelters' slags for their zinc and lead contents.

The smelters of the Mežica mine (Slovenia) produced in 1957 13,283 tons refined lead (12,543 tons in 1956) from their own concentrates. The new Dwight Lloyd sintering plant operates up- and down-draft very satisfactorily; the Short-Drum-furnaces are not yet in operation. A new flue channel and as second stack were built. The old mine Sitarevec near Litija (Slovenia) is being reopened and will produce lead, zinc, and barite concentrates.

The production of zinc doubled in 1957. The smelters at Celje (Slovenia) produced 16,481 tons (13,809 tons in 1956) and the electrolytic zinc plant at Sabac (Serbia) 12,978 tons (6019 tons in 1956). Sabac also produced electrolytic cadmium at a rate of 30 to 35 tons per year (8 tons in 1956). The capacity of the Sabac plants will be enlarged to 24,000 tons electrolytic zinc and 60 tons cadmium per year.

Copper ore output of the Bor mines (Serbia) increased 12 percent. Blister copper production increased 15 percent and electrolytic copper 20 percent, being higher than ever before. The new flotation plant has Fagergren cells, and the old flotation plant will be fitted with such cells. A new 400-meter shaft was sunk to undercut the open-pit workings. An agreement was signed with a French-Belgian financial group for the opening up of the Majdanpek mines at a rate of 10,000 tons 0.9 percent copper ore per day. Over \$50,000,000 will be spent for this and the reconstruction of the copper smelter at Bor. The work is well under way; a new railway line has been built to Debeli Lug (near Majdanpek), and the narrow gauge railway to Bor will be replaced by a normal sized one in 1958. At Bor and at Prahovo (on the Danube) the ground is being levelled for the new

plants. Bor will produce 230,000 tons of sulphuric acid and deliver it to Prahovo where 575,000 tons of superphosphate will be produced per year.

Pyrite concentrate production increased 22 percent. Nearly 90 percent is from Bor, the remainder from Trepča.

Antimony ore output increased slightly, the metal production increased 7 percent. At Stolice near Zajača (Serbia), a new flotation plant with a capacity of 200 tons ore per day is under construction. Also a new shaft was sunk.

Mercury production at Idria (Slovenia) was 7 percent lower than in 1956 as the ore was of lower grade. To decrease losses and increase metal production again, a big kiln will replace the ancient shaft furnaces. At Avala, south of Belgrade, prospecting for mercury ore shows promising results.

Bauxite output remained on the same level. In several places new deposits have been discovered. Most promising are the newly discovered deposits north of Titograd (Montenegro) where large quantities of high-quality bauxite are being developed. Alumina production was more than 50,000 tons, 80 percent of this from Kidričevo (Slovenia), the rest from Moste-Ljubljana and Lozovac. Part of the alumina has been exported.

Aluminum production increased 23 percent; it is now 10 times higher than in 1939. Kidričevo (Slovenia) produced 14,961 tons and Lozovac (Dalmatia) 3,173 tons. The agreement between Yugoslavia, the Soviet Union, and East Germany providing financial and technical help for the construction of a new alumina-aluminum plant near Titograd (Montenegro) was completed, and construction began on the necessary power plants and roads. The capacity will be 50,000 tons aluminum per year in 1964, later to be doubled.

Chromite output remained on the level of previous years. Most of it is used for the production of ferro-alloys, refractories, and chemicals. At the new Jegunovci plant (Macedonia), four electro furnaces have gone into operation since July 1957 producing high-grade ferro-silicon and ferro-chrome. Total capacity is 6,000 to 7,000 tons per year.

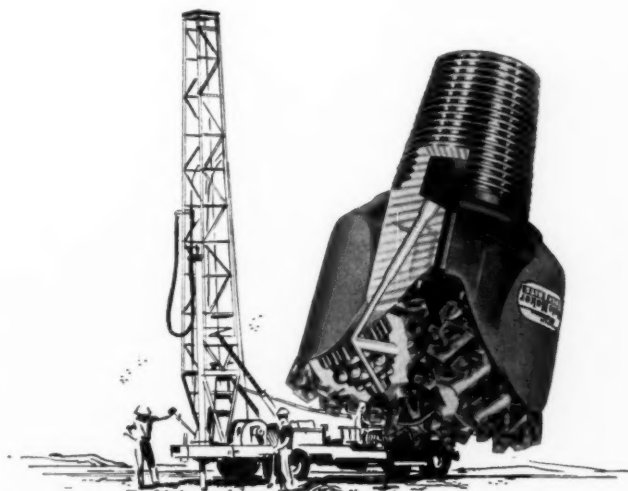
Iron ore output increased 9 percent, most of it from Vareš (Bosnia). At Damjan near Stip (Macedonia), a newly found magnetite ore body is being prepared for an output of 300,000 tons per year. Pig iron production has increased by 13 percent and steel production 18 percent totalling more than 1,000,000 tons.

The Five-Year Plan for 1957-1961 asks for a yearly increase of industrial production at a rate of 11 to 12 percent. In 1961 production of the main metals should be: steel 1,370,000 tons, copper 40,000 tons, aluminum 35,000 tons, lead 75,000 tons, zinc 32,500 tons, and mercury 530 tons. Investment preference is given to power plants, coal and oil mining, metal mining, smelting and fabrication, chemical industry etc. Several projects are listed as particularly important: the Majdanpek-Bor-Prahovo project providing an additional 25,000 tons copper per year, the 50,000-ton-per-year aluminum combine at Titograd, the Idria kiln adding 100 tons mercury to the present production, the two lead-zinc mines at Kišnica and Srebrenica, and the enlargement of the zinc electrolytic plant at Sabac. 1957 production was well ahead of the estimate, except for mercury.

Metric Tons of Metal and Alumina Produced in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, 1956, and 1957

Metal	1939	1951	1952	1953	1954	1955	1956	1957
Refined Lead	10,651	60,068	67,180	70,796	66,729	75,612	75,759	78,504
Zinc	4,918	13,223	14,463	14,349	13,644	13,767	14,003	29,459
Blister copper	41,043	32,011	32,819	31,190	30,295	28,260	29,384	33,735
Electrolytic copper	12,463	14,004	21,390	27,764	26,946	24,837	25,008	30,128
Antimony	1,500	1,229	1,329	1,410	1,552	1,605	1,663	1,769
Mercury	378	505	504	492	498	503	456	425
Aluminum	1,795	2,828	2,563	2,792	3,496	11,499	14,682	18,134
Bismuth	—	88	99	98	110	104	111	100
Silver	—	94	80	95	88	93	86	81
Alumina	7,141	9,000*	NA	NA	NA	NA	48,206	50,236

* Approximate.



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AFRICA

ALGERIA

The instability of the region's political situation thwarted development of the mining industry in 1957. Nevertheless, some segments of the industry, notably iron, lead, copper, pyrites, and phosphate, maintained the level of 1956 output or even surpassed it.

Although iron ore output was not as great as in 1955, there was about a six percent increase in 1957 over 1956 with an output of 2,790,000 metric tons as compared with 2,600,000 in 1956. Some of the high-grade ore is exported to Great Britain. The country's reserves are now estimated at 100,000,000 tons, located chiefly at Quenza, Zaccar, and Beni-Saf.

Production of zinc decreased in 1957 to 49,000 tons, compared with 57,000 tons in 1956; lead ore output was 15,000 tons, compared with 14,500 in 1956. Copper ore production has been steadily increasing since 1955, with output in 1957 totalling 1,730 tons compared with 600 in 1956.

Antimony output decreased to 4,000 tons, compared with the previous year's total of 6,000. Pyrite mining produced 18,000 tons of ore in 1957, compared with 6,000 in 1956; in 1955 pyrite mining had been shutdown completely. Phosphate production was maintained at about 600,000 tons.

BECHUANALAND

Production of chrysotile asbestos continued from Moshaneng mine in the Bangwaketse Reserve in the Southern Protectorate and the output for 1957 was 1,110 short tons above the figure for 1956. A limited amount of kyanite was produced from the Halfway Kop mine, in the Tati Concession. Some gold and silver was also produced in this area from small workings.

Two small manganese mines were opened in the south-eastern Protectorate during the second half of 1957 following the award of Crown Grants to two mining companies. The one occurrence is in the Bangwaketse reserve and ore occurs as pods and larger lenses in a shale horizon immediately overlying the Black Reef quartzites of the Transvaal System. No export of ore took place from this occurrence during 1957, but active development is in progress. The second occurrence is in the Bamaletse reserve where the ore occurs as stringers, veins, and impregnations in a porous quartzitic sandstone associated with the Polo Ground Quartzite horizon of the lower Timeball Hill stage of the Pretoria series (Transvaal System). Pyrolusite and Psilomelane constitute the ore minerals. A limited amount of ore was exported from the Bamaletse reserve in 1957. A characteristic feature of both occurrences is that the manganese ore is very low in iron.

A geochemical and magnetic survey was carried out at the Magogapate nickel occurrence in the Bamangwato reserve to follow up the earlier work carried out there.

The Anglo American Corporation of South Africa, as technical advisers to De Beers Consolidated Mines Ltd., continued prospecting operations in the Tuli Block farming areas during 1957. The mineral rights in the Tuli Block are owned by the British South Africa Company.

BELGIAN CONGO

The diamond production of the Belgian Congo reached a new record in 1957 with 15,644,000 carats against 14,010,478 in 1956. The increase is due to the Bakwanga mines which produced 15,016,000 carats of Lubilash diamonds, compared with 13,383,509 in 1956. These are practically all industrial diamonds. The production of the Kasai alluvial mines of the Forminière remained stationary at about 628,000 carats, compared to 626,969 in 1956.

The gold output increased to over 12,307 kilograms in contrast with 11,524 kilograms in 1956. The increase comes from the Société des Mines d'Or de Kilo Moto, the biggest producer, which is mining a primary deposit with important reserves.

The nonferrous metals were not affected much in 1957, but will be deeply influenced in 1958 by the decrease in world consumption and the fall in prices. The copper production of the Union Minière decreased from 250,000 tons in 1956 to 242,600 tons in 1957. The development program of this big company has not been stopped but it will be extended over a much longer period.

The connected production of cobalt also decreased slightly while the production of metallic zinc was not affected and increased from 42,084 to 49,194 tons.

Manganese ore production rose from 329,535 tons in 1956 to 367,021 tons in 1957.

Production of cassiterite remained almost stationary at 15,116 tons against 15,228 in 1956. To this must be added 2,802 tons of mixed ores containing about 2,240 tons of cassiterite. This situation will be entirely changed in 1958 as the International Tin Committee decided to curtail the exports and consequently the production. For the Belgian Congo the reduction is fixed at 40 percent for the first half of the year.

Production of columbite and tantalite fell from 418 tons in 1956 to 154 tons in 1957. This is due to the suppression of the bonus and the nonrenewal of United States contracts which practically closed the market. Sales are now very scarce and at prices which make the mining of these ores uninteresting.

Beryl is still produced but at a lower rate than last year. The deposits are very erratic and the pockets hard to find. Production of germanium for 1957 is not yet available but it probably is of the same importance as in 1956 which was about 600 kilograms. Until now germanium has been extracted only from the fumes of the zinc plants but a deposit of germanium-bearing topaze has been reported. Cadmium production remained stationary at 275 tons compared to 277 tons in 1956.

FRENCH EQUATORIAL AFRICA

Extensive preparations (surveying and planning) for mining and transportation of manganese and iron ores from Gabon continued in French Equatorial Africa in 1957.

Production of gold, lead, and diamonds were all down from 1956 outputs. Gold to 957 kilograms from 1,266; 52 percent lead concentrate to 3,480 metric tons from 6,000; and 61,000 carats of diamonds (from d'Oubangi) down from 145,800 in 1956.

FRENCH WEST AFRICA

Prospecting by the "Executive Board of Mining and Geology" led to the discovery of deposits of iron ore and of bauxite in Guinée; of concentrations of ilmenite in the sands along the coast of Senegal; signs of copper in the Ivory Coast; and various pipes of kimberlite in the southern Soudan, where investigations for diamonds will be intensified.

During the year 1957, the production of iron ore increased to 1,091,000 metric tons, against 847,000 tons in 1956. This production rate should be maintained.

The production of bauxite decreased once more from 452,000 tons to 385,000. The exports were 362,000 tons. This decrease was brought about, to a great extent, through the reticence of the Canadian buyers, the most important clients of the producing company.

After the considerable progress made in 1956, the diamond production decreased from 390,000 to 222,000 carats in 1957.

The development of the washing plants for the sands of the beaches to the south of dakar, has increased production from 20,000 to 36,000 tons of ilmenite.

GHANA

Despite economic conditions Ashanti Goldfields Corporation Ltd. managed to achieve a record in that the milling and recovery figures during the last financial year were the best in the company's history. The mill handled 338,737 tons of ore for a recovery of 275,332 ounces of gold equal to 16% dwt. per ton. These record figures may be attributed to the recent policy of reconstruction which has provided a new shaft system with adequate facilities for hoisting and ventilation from deep levels while exceptionally high values continued to be exposed in current development. Another factor which affected operation favorably was that improvements in the roasting and cyanide practice have resulted in a substantial reduction in the amount of gold leaving the plant in cyanide residues.

As far as the other gold producers are concerned Ariston Gold Mines (1929) Ltd. gave high priority to deep exploration on account of good values being encountered in an ore body which split into two sections which may mean that there will be two payable reefs instead of one. Better extraction rates were also obtained following the adoption of a new gold reduction process.

At Bibiani (1927) Ltd., efforts were made to prove the extent of values located on the surface while a systematic investigation was also being carried out in order to establish whether a useful tonnage can be obtained in some of the old workings on the upper levels of the mine.

In the diamond mining industry Consolidated African Selection Trust Ltd. met greater difficulties in that the accessible high grade ground is becoming scarcer

Ghana Mineral Exports and Value in 1954, 1955, 1956, and 1957¹

Commodity	1954		1955		1956		1957	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Bauxite ^a	156,956	276,258	116,285	203,505	137,872	331,207	123,356	301,757
Manganese ^a	423,038	4,812,690	539,580	5,192,232	635,851	7,043,796	500,512	6,987,726
Gold ^b	724,703	9,005,506	723,905	9,048,535	599,340	7,488,781	580,093	7,228,514
Diamonds ^c	1,963,670	3,719,712	2,276,531	5,529,624	2,518,563	7,920,446	2,230,715	7,238,353
Total Value:	17,814,166		19,973,896		22,784,230		21,756,350 ^d	

1. Total nine months. 2. Long Tons. 3. Troy ounces. 4. Metric carats.

but a 25 percent higher rate of production of lower ground enabled the company to produce an unchanged diamond recovery. To mine the lower grade deposits further a new washing plant (costing about £800,000), which will be half completed in 1959 and in full operation in 1961, will be erected.

The output of manganese has and still suffered from the depressed state of the base mineral market and the same applies to bauxite production. As far as the latter is concerned the £300,000,000 Volta River hydroelectric plan which aims at producing cheap electric power, which would make it possible to produce aluminum from extensive bauxite deposits made no progress.

An official statement from Mr. Gbedmah, the Finance Minister stated that Ghana did not intend to nationalize the mining industry "either now or in the immediate future" was of great value.

KENYA

There was a small increase in mineral production in Kenya during 1957 as compared with 1956. Magadi Soda Company continuing as the main producer. Value of soda ash and salt produced at this property was £1,480,394.

Due to rising costs of production, gold output and value during the year (£91,000) fell by nearly 50 percent from 1956 (£172,000). Blister copper production from Macalder-Nyanza mine was 2,115 tons valued at £421,774. These results reflected the first full year's production from the new mill opened in April 1956.

Owners of the kyanite property at Murka continued reequipment of the mine and mill, but no mineral was produced. Graphite production from the S. V. Devshi mine was doubled at 942 tons worth £47,125.

Investigations continued at the Anglo-American Prospecting Company's Mrna Hill columbite property.

MADAGASCAR

Graphite continued to be the most important mineral in Madagascar in 1957. Production and exports were maintained at 15,000 to 16,000 annual metric tons (10,000 fine grains and 6,000 powder).

Mica output increased to 800 tons from 540 in 1956. It should be maintained at higher rate in 1958.

Prospecting disclosed important tonnage of monazite sands during the year.

MOROCCO

Several all-time records were achieved by Moroccan mines in 1957, both from the production and the export points of view. Total exports, the north and south zones counted together, were approximately 20 percent better than in 1956.

As usual, phosphates were the most valuable and the most voluminous, 1957 output reaching the record total of 5,567,519 tons as against 5,521,817 tons the year before. Exports totaled 5,356,574 tons and local sales were 75,239 tons.

Next largest tonnage was produced by the iron ore mines with 1,400,200 tons from the Spanish mines at Nador and 467,922 tons from the French mines at Ait Amar and elsewhere in southern Morocco, making a grand total of 1,868,122 tons, another record for Morocco. Exports (southern area only) were 407,197 tons to Britain, 72,880 tons to West Germany, and 18,603 tons to The Netherlands, a total of 498,680 tons.

Lead mining progressed from 120,047 tons of ore in 1956 to 127,108 tons in 1957, plus 1,356 tons from northern area mines making a total of 128,464. During the year the Jebel Aouam mine near Khenifra (Penarroya) went into operation and produced 530 tons of ore monthly at 10-11 percent; working full blast, these workings are expected to produce 1,000 to 1,500 tons monthly or as much as Morocco's biggest producer so far, the Aouli mines in eastern Morocco.

Manganese topped all previous production figures with 414,435 tons of metallurgical grade and 77,053 tons of chemical, as compared to the 1956 figures of 383,115 tons and 38,294 tons, respectively. Demand for chemical grade was so high that ready buyers were found for 53,529 tons, while a total of 344,759 tons of lower grades went for export.

Cobalt (4,230 tons compared to 6,438 tons in 1956) and copper (2,138 tons compared to 2,863) were disappointing, and operating difficulties do not seem likely to improve much in the coming year.

Lead metal and silver production continued to be steady stand-bys for export; 29,708 tons of lead metal were shipped to France, the USA and Algeria, while 17 tons of lead metal and 287 tons of lead piping went to the local market. Silver extracted from eastern lead-zinc ores totaled 26,714 kilograms exported to France.

Mine operators generally had to face rising costs in 1957, the main item being the increase in wage scales demanded by the Moroccan Labor Federation. Several strike threats in support of wage claims were averted after the intervention of the Moroccan authorities, mainly at Penar-

roya's Mibladen and Aouli lead-zinc mines, the Imini manganese mine, and the Sidi Maarouf concentration plant in Casablanca (operated by the Société Anonyme Chérifienne d'Etudes Minières).

MOZAMBIQUE

The governmental ban on radioactive mineral prospecting ended in Mozambique in 1957. However, licenses were hard to obtain and no important discoveries were reported. Tete district where davidite is found along a gabbro limestone contact is the most important source of uranium in Mozambique.

Intensive and systematic prospecting brought success to Companhia Mineira Lillas of Mozambique. Spectacular beds of coal were found cropping out in the bed of the Morungodzi River in the Tete district. This new field is only eight miles from the Moatze railroad station. Important iron ore deposits had previously been discovered in the area by Companhia Lillas so extensive exploration drilling is programed for 1958 and 1959.

Despite the serious drop in the price of copper the Central Mining and Investment Company of Johannesburg continued its drilling program for copper in the Tete district.

The governor general of Mozambique, Commodore Gabriel Teixeira, has done much to aid the mining industry by encouraging road and railroad building. The Portuguese government considered proposals to rewrite the ancient laws dealing with mining so that companies will be encouraged to invest in the country.

Also to promote mining the government asked for and accepted several tenders from foreign companies for prospecting in the Tete and Alto Ligonha districts.

NIGERIA

Production of cassiterite continued to expand in Nigeria at an increasing rate up to the end of November 1957, when the statistical position of tin showed a critical surplus which forced the International Tin Council to introduce export restrictions. In the case of Nigeria this meant cutting production by 40 percent whereas the restrictions imposed on all producers covered by the tin agreement worked out to only 28 percent. As a result 1957 exports were slightly lower than the shipments made during 1956.

As could be expected columbite production declined during the year because the metal price was so low. The trend is for further reductions as demonstrated by

Nigerian Minerals and Export Value in 1954, 1955, 1956, and 1957¹

Commodity	1954		1955		1956		1957	
	Metric Tons	£ Value	Metric Tons	£ Value	Metric Tons	£ Value	Metric Tons	£ Value
Tin	10,309	5,170,344	11,399	5,868,474	13,364	7,297,490	13,150	7,160,000
Columbite	2,524	5,127,613	3,047	5,166,927	2,406	1,762,135	1,923	1,177,000
Tungsten	7	4,470	3	2,153	5	4,267	2	800
Lead	154	10,034	73	3,963	105	8,450	623	49,000
Zinc	125	3,375	—	—	—	—	—	—
Tantalite	5	13,725	9	9,692	15	20,266	17	34,000
Other Minerals	—	—	—	—	749	29,825	1,247	73,000
Gold ²	—	—	—	—	—	—	487	6,000
Total Value:	10,329,561		11,051,209		9,122,133		8,499,800	

1. Approximate. 2. Troy ounces.

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Africa

the fact that in July 1957, the output was 241 tons but in December production was only 113 tons—the lowest for five years.

No progress was made regarding the reopening of the Abakaliki lead-zinc mine but negotiations were continued regarding the financing of this project. Production came mainly from small underground workings near Wase which gave an output of 400 tons of galena in the first half of 1957, dropping to 177 tons in the second half.

A strong demand was built up for tantalite but known occurrences are small and sporadic. There was a steady production of monozite from alluvial sources and thorite was won from mill rejects obtained from primary columbite processing.

A milestone in the history of Nigeria has been reached in that diamond prospecting may now be carried out if a special license is obtained whereas hitherto the country was completely closed for diamond prospecting.

The total number of mining operators was 166, 13 more than in 1956 and their combined labor force amounted to 58,180 which compares with 60,249 in the preceding year.

NORTHERN RHODESIA

The year 1957 was very eventful for the mining industry of Northern Rhodesia. Commencing with confident optimism, despite falling demand for base metals, two new copper mines and a metallurgical plant were brought into production. Toward the end of the year, however, with base metals at their lowest prices for several years, there was a reassessment of the position and, in some cases, a voluntary reduction in output.

The Bancroft mine, of the Anglo-American Group, with a rated capacity of 40,000 long tons of copper per year, was rapidly brought into production and started up on a limited tonnage rate at the beginning of the year to take advantage of the high copper prices. Serious mining difficulties were experienced as a result of bad ground and excessive water, and at no time was the rated capacity reached. With the low copper price at the end of the year, it was generally recognized that Bancroft operated at a substantial loss.

Kansanshi Copper Mining Company, Ltd., a small copper mine situated to the west of the Copperbelt and near the Belgian Congo border, was flooded in November following a breakthrough into a large pocket of underground water. This is an old mine with a somewhat chequered past and had been reopened by Anglo American Corporation for the purpose of making a thorough examination of its possibilities. In view of the heavy inflow of water and the low price of copper, the decision was made to leave further work in abeyance.

Nchanga Consolidated Copper Mines Ltd., which is the lowest cost Copperbelt producer as a result of its high grade ore and cheap block caving method of mining, continued the development of its two open pits but at a reduced tempo. Additions to the concentrator were completed during the year and part of the tonnage milled was made up of highly oxidized ore from the open pit.

Rhokania Corporation Ltd. became the first, and only, producer of uranium oxide in Northern Rhodesia when the Nkana mine uranium plant was started up in mid-year.

Rhodesian Selection Trust was able to raise £16,000,000 for the purpose of financing the development of the Mufulira West ore body to the production stage of the 8,000 tons of ore mined and milled per day. This work will be continued but it was not possible to obtain acceptable terms to finance the promising Chambishi project (copper) which was left in abeyance.

Construction at Ndola Copper Refineries, a Roan Antelope Copper Mines Ltd.'s subsidiary which will electrolytically refine copper from that mine, proceeded without interruption during the year. The first unit of the refinery, with an annual capacity of 55,000 long tons of copper, is scheduled to go into operation in 1958. Preliminary work is also well under way on the second unit to double capacity. The adjoining cobalt plant of Chibuluma Mines Ltd. started up during the year after some initial technical difficulties and produced an enriched cobalt-copper matte from mixed Chibuluma cobalt-copper concentrate.

In July, in an effort to prevent a further fall in copper price, Selection Trust Group proposed, and adopted, a 10 percent cut in production for their two major mines, Mufulira and Roan Antelope, but the

Metal and Mineral Production in Northern Rhodesia in 1955, 1956 and 1957 and Value in Rhodesian Pounds

Commodity	1955		1956		1957*	
	Quantity	Value £	Quantity	Value £	Quantity	Value £
Gold ¹	362.5	4,525	3,329.42	41,067	3,802	36,550
Silver ¹	109,130	34,964	609,107	191,285	514,056	165,728
Cobalt, metal ²	8,228	967,649	16,442	1,928,900	21,453	1,983,090
Cobalt, alloy ²	7,464	291,030	2,416	110,478	977	46,862
Cobalt, other ²	5,744	297,944	7,061	357,728	45,186	464,932
Copper, blister ²	165,074	52,230,345	157,531	47,271,095	169,531	34,200,053
Copper, concentrate ²	973	45,919	584	29,659	2,692	119,906
Copper, electrolytic ²	177,098	61,659,741	225,953	73,729,521	246,680	54,416,299
Copper, other ²			70	19,805	831	66,981
Iron ore ²	2,164	2,164				
Lead ²	16,050	1,700,247	15,200	1,768,495	15,000	1,436,559
Manganese ore ²	17,331	204,424	39,438	491,422	36,869	479,802
Selenium ⁴			32,712	121,764	26,656	106,520
Zinc ²	27,900	2,529,839	28,925	2,828,266	29,500	2,396,028
Uranium oxide ⁴					52,457	
Beryl ²	17.64	2,505	12.34	1,531	5	595
Limestone ²	304,590	333,290	367,046	371,997	449,283	376,400
Mica, sheet ⁴	4,557	570	5,821	1,455	627	157
Phyllite ²			4,215	632	16,966	2,545
Amethyst ⁴			3,128	120		
Cadmium ²			52	69,721	56	74,124
TOTAL VALUE		£120,305,156		£129,334,941		£96,373,129

1. Fine ounces 2. Hundredweight 3. Long tons, 2,240 pounds 4. Pounds * Preliminary subject to adjustment.

new, relatively small, Chibuluma mine was left at full output. Anglo-American rejected a similar proposal, using the argument that the inability of Bancroft to reach scheduled capacity was, in effect, a potential reduction in output. In this connection it is to be noted that overall copper production in Northern Rhodesia was some 33,000 tons higher in 1957 than in 1956, despite the output cuts.

Production of manganese ore continued from the Bahati mine, near Fort Rosebery, and additional leases in that area were taken up by the Vanadium Corporation of America.

Towards the end of the year, Rhodesian Broken Hill closed down the lead blast furnace but continued a limited production of lead with a Newman hearth. Zinc and cadmium production were continued at practically the same level as for the previous year.

NYASALAND

The principal interest in minerals in Nyasaland during 1957 was again focused on radioactive minerals. Some of the monazite bearing sands on the western shore of Lake Nyasa have been fully examined but development has not commenced. The sands contain ilmenite, rutile and zircon as well as radioactive monazite. The deposits on the eastern lake shore were not investigated to the same extent.

The deposits of uranium bearing minerals, including davidite and betafite, discovered in 1956 by a mining company prospecting in the Tambani area to the west of the middle Shire Valley were still the subject of investigation by that company. It is not yet known whether these will prove economic.

A British company, engaged in the titanium industry, made good progress with its investigations of the ilmenite and rutile deposits in the lower Shire Valley between Chiromo and Port Herald. The company established a laboratory on the site to enable advanced examination to be carried out there.

The Anglo American Corporation did no field work on the apatite deposit at Tundulu Hill during the year. The results of sampling having shown that the quantity of high grade ore is rather less than had been expected, the corporation was engaged in carrying out ore dressing tests with a view to raising the average grade of product in order to meet the high cost of transport which would be involved in exporting the ore to a factory in Southern Rhodesia, where it could be converted to fertilizer.

Interest was maintained in the vermiculite deposits near Mpatamanga to the west of Blantyre and in the pyrochlore deposits on Chilwa Island. In view of the present low market price and lack of demand for pyrochlore it appears that it would not be economic to work the latter at the present time.

The holders of the mining lease intimated that they have decided not to do any further work on the cerium-rich monazite at Kangankunde Hill in the Zomba District, in view of difficulties experienced in working out an economic method of extraction for the monazite. As this deposit is rich in rare earths it is expected that further investigations of it may be undertaken in the not too distant future.

Appreciable interest has been shown in a substantial iron ore deposit in the Blantyre District of the Southern Province and at the end of the year a large trial consignment was being mined for shipment to Europe.

SIERRA LEONE

The system of licensed mining and buying of diamonds continued in force in 1957 and, following a series of well-organized raids by illicit miners, security arrangements were tightened. As a result authorized buying increased and this is one of the reasons why diamonds and not iron ore were the leading export commodity. Another reason is that the Dia-

mond Corporation's official buying agency is offering higher prices as practically demonstrated by the fact that the average price per carat on the basis of the first nine months of 1957 was about 158 shillings whereas the average price realized during 1956 was only 107 shillings. Nevertheless a very considerable amount of illicit traffic in diamonds existed.

The diamond export figure for the period January to September 1957 was 679,144 metric carats valued at £5,377,120 which compares with 478,627 valued at £2,708,620 during the corresponding period of 1956, and 647,797 carats valued at £3,457,385 for the whole of 1956.

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Africa

Sierra Leone Selection Trust Ltd. was the leading diamond producer and will likely remain in that position in the future, particularly in view of the fact that the firm was erecting a £550,000 diamond treatment plant at Tongo at year's end.

Iron ore exports during the first nine months of 1957 and the corresponding 1956 figures (in brackets) were 1,103,726 (988,660) tons valued at £3,312,410 (£2,994,946) which compares with the 1956 total of 1,328,019 tons valued at £4,003,016.

Chrome ore exports were running below 1956 level, the tonnage shipped between January and end of September 1957 being 11,984 tons valued at £126,075. During the same period of 1956 the tonnage amounted to 14,237 which brought in £131,280 whereas exports covering the whole of 1956 came to 18,774 tons valued at £194,630.

British Titan Products continued prospecting of its rutile deposits but arrangements for mining had not been made at year's end.

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Mineral Exports from Sierra Leone for 1954, 1955, 1956, and 1957¹

Commodity	1954		1955		1956		1957	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Diamonds ²	443,593	1,699,875	401,423	1,400,478	647,797	3,457,385	679,144	5,377,120
Iron ore ³	877,306	2,707,324	1,331,573	3,709,595	1,328,019	4,003,016	1,103,726	3,312,410
Chrome ⁴	15,120	165,025	17,250	192,331	18,774	194,630	11,984	126,075
Gold ⁴	2,530	26,573	200	2,542	400	4,741	N.A.	N.A.
Total Value:		4,598,797		5,304,946		7,659,772		8,815,605

1. First nine months of 1957. 2. Metric carats. 3. Metric tons. 4. Troy ounces. N.A. Not available at date of publication.

SOUTH WEST AFRICA

Increased interest in South West Africa's mining potential by major companies was the highlight of 1957.

An extensive aerial and ground prospecting program was advanced by the Anglo American Corporation's group. The Consolidated Gold Fields of South Africa's group initiated prospecting. Mineral Development Corporation (Pty.) Ltd. was formed by African Metals Corporation (South Africa) to take over properties and investigate mineral rights. Tsumeb Corporation Ltd. (the United States firm, Newmont Mining Corporation) discovered two ore bodies at the Asis mining claims 30 miles from Tsumeb containing 1,000,000 tons of 11 percent combined lead plus copper. Exploration was continuing at year's end.

Consolidated Diamond Mines developed a new area, and expanded output further; continued with its program of

modernizing and modifying plant and installing additional equipment; and had on its schedule, the erection of a new recovery section. Industrial Diamonds of South Africa (1945) Ltd. opened up a new diamond terrace located in the company's Luderitz holdings, from which production was initiated. Extravagant claims of rich diamond disclosures in the Karasburg concession area of the South West African Diamond Corporation were officially denied; but reports have persisted that diamonds, as well as tantalite and monazite occurrences were disclosed. South African Minerals Corporation consolidated its position as a major manganese ore producer, in which underground operations were initiated to supplement surface quarrying, and planned further improvements of its rail-head and port loading facilities.

There were unconfirmed reports of the discovery of a major copperbelt. Lorelei Copper Mines, developed on a small scale copper-molybdenite deposits in which reserves of 20,000,000 tons were proved

Production Sales and Sales Value of Important Metals and Minerals Produced in South West Africa in 1955, 1956, and 1957*

Commodity	1955		1956		1957	
	Production	Value	Production	Value	Production	Value
Diamonds ¹	812,786	£14,219,570	988,039	£19,059,077 ²	996,610 ³	£15,912,796
Lead ⁴	83,709	—	221,361 ⁵	14,521,845	246,465 ⁶	10,902,664
Copper ³	23,562	—	—	—	1,678	41,123
Zinc ³	23,231	—	—	—	—	348,600
Manganese ore ³	30,013	269,532	57,262	610,172	89,661	1,026,442 ³
Lead Vanadium ³	7,663	478,286	4,050	335,610	3,512	267,870
Lithium ore ³	4,255	85,123	5,645	63,906	6,743	97,014
Silver ⁴	979,214	—	1,632,287	—	—	—
Tin conc. ³	702	136,000	449	180,457	634	289,000
Cadmium ³	398	—	—	—	1,420	—
Beryl ore ³	—	46,650	454	46,563	386	158,089
Germanium ³	—	—	10	—	—	—

* Records of Government Mining Engineer. 1. Metric carats. 2. 910,803 carats gem stones. 3. Short tons. 4. Troy ounces. 5. Estimated. 6. Total lead, zinc, copper concentrates.

Metal and Mineral Production and Value in Southern Rhodesia in 1955, 1956 and 1957

Commodity	1955		1956		1957	
	Quantity	£ Value	Quantity	£ Value	Quantity	£ Value
Gold ¹	524,701	6,512,846	536,392	6,657,964	536,849	6,663,655
Gold premium ²	—	69,300	—	66,735	—	84,672
Silver ⁴	76,847	24,693	76,870	25,229	74,179	24,219
Antimony ore ³	570	6,860	114	10,904	159	12,481
Arsenic ³	508	4,062	1,084	8,672	883	6,260
Asbestos ³	105,261	7,051,831	118,973	8,524,671	132,124	9,016,388
Beryllium ore ³	964	108,303	606	69,045	572	63,751
Chrome ore ³	449,205	2,191,993	448,968	2,671,088	654,077	4,517,500
Columbite ore ³	612	9,971	2,54	1,463	88	126
Copper ³	1,179	259,668	1,932	405,757	1,118	254,444
Corundum ³	1,169	6,448	4,448	27,670	4,506	29,329
Fluorspar ³	480	3,506	943	3,487	97	339
Iron ore ³	92,835	17,469	127,954	23,930	148,768	27,903
Lead conc. ³	27	1,196	31	1,897	43	2,194
Lithium	—	—	—	—	—	—
Amblygonite conc. ³	180	6,300	646	31,446	121	3,213
Eucryptite	—	—	—	—	56	1,200
Petalite ore ³	24,210	120,828	13,524	67,620	9,934	48,987
Lepidolite ore ³	57,714	201,063	84,599	302,396	93,545	380,767
Spodumene ³	51	253	4,445	17,271	5,599	19,536
Magnesite ³	11,610	32,237	8,611	12,917	2,910	4,365
Manganese ore ³	1,330	665	816	408	1,785	893
Mica block ⁴	141,616	36,387	123,214	35,650	70,044	23,787
Nickel ore ³	18,20	437	200	8,398	359	21,020
Tantalum conc. ³	2,23	3,414	14,66	21,708	38,48	41,762
Tin conc. ³	336,6	144,071	566,9	262,370	47,44	19,461
Tungsten conc. ³	226,27	144,738	264	168,133	167	91,602

1. Fine ounces. 2. By government. 3. Short tons. 4. Pounds.

and/or indicated, planned an increased milling and treatment rate, including the provision of differential flotation of copper and molybdenum concentrates.

SOUTHERN RHODESIA

In spite of tremendous decreases in metal prices during 1957, the year again proved a record one for mineral production. Values totaled over £25,000,000. The major increases were in asbestos and chrome, though figures for the latter are misleading in that they represent chrome mined during the year, the Rhodesia Railways succeeded in overtaking a great backlog of chrome transport.

Though lower grade varieties of chrome proved more difficult to sell, a great spurt in pegging activity took place at the year end. Much deep level ground is known to exist along the centre of the Great Dyke, and it was this portion that attracted the interest of several mining houses not normally associated with chrome mining.

The Messina Transvaal Development Company brought its Mangula copper mine to production with the starting up of one Aerofall mill unit, and concentrates are being shipped. This company's production from the small Umkondo mine continues, but it has ceased drilling on its Sanyati claims.

A discovery of very good quality emeralds in the Belingwe Reserve caused international interest. Development is being carefully controlled so as not to effect the limited world market.

The closing down to a care-and-maintenance level of Rio Tinto's much vaunted Empress nickel mine in the Ngondoma came as a considerable disappointment to the mining community as a whole. The reasons for suspending development operations are given as insufficient reserves proved to date, coupled with the necessity for a good copper price.

Lithium minerals continue to be a major new export, and it is believed that Rand Mines Limited and Billiton Maatschappij are both considering entering this field. Southern Rhodesia's potential reserves of this mineral are virtually unlimited.

Southern Rhodesia looks like being a nonstarter in the atomic minerals race, in spite of considerable efforts made by the United Kingdom Atomic Energy Authority to stimulate uranium prospecting. The Authority commissioned Hunting Geophysics Limited to carry out a scintillometer survey covering a degree square of little known, but likely, country. Maps of the anomalies were sold to the public at nominal price, and though a considerable pegging rush ensued, no worthwhile find has so far materialized.

TANGANYIKA

Provisional value of mineral production in Tanganyika during 1957 is £5,460,000, a slight increase over 1956. Diamonds remained the mainstay of the industry and there was increased production at Williamson Diamond, Ltd. with the new recovery plant operating at high efficiency.

Uruwira Minerals Ltd.'s Mpanda mine

Production and Export of Metals and Minerals in Tanganyika and Their Value in 1955, 1956, and 1957

Mineral	1955		1956		1957 ¹	
	Quantity	Value	Quantity	Value	Quantity	Value
Diamonds ²	322,607	£1,199,437	357,538	£2,855,273	372,738	£3,287,782
Gold (refined) ²	68,892	864,279	59,293	741,582	54,088	678,287
Gypsum (raw) ⁴	7,812	16,285	9,450	18,167	9,510	17,998
Kaolin ⁵	46	507	10	105	—	—
Lead concentrates ⁵	8,822	790,000	14,251	1,210,332	12,625	882,477
Lime ⁴	955	4,471	782	3,476	484	2,424
Magnesite ⁴	328	820	243	597	254	635
Meerschaum (crude) ⁴	4.30	227	6	290	4	177
Mica (sheet) ⁴	65	68,083	57	58,734	67	69,474
Mica (waste) ⁴	274	2,739	125	925	—	—
Salt ⁵	9,498	90,207	9,359	92,613	8,572	85,207
Silver (refined) ³	43,292	13,990	35,020	11,504	20,520	6,739
Tin concentrates ⁴	55	29,114	21	11,741	20	10,755
Tungsten concentrates ⁴	24	17,625	15	10,929	—	—
TOTAL: (Exports only)	—	£5,097,924	—	£5,016,268	—	£5,041,955

1. Estimated 2. Metric carats 3. Fine ounces 4. Long tons 5. Metric tons

was seriously flooded in April causing a one month stoppage. Production of lead fell from 14,251 tons in 1956 to 12,625 tons in 1957.

Gold production was also slightly lower. Further development work continued at the Geita mine. At Kiabakari (Tangold Mining Company Ltd.) a 450 foot shaft was sunk and a 15,000 to 20,000 ton a month treatment plant almost completed. Exports from the Chunya goldfield were down to 4,315 ounces.

At the Mbeya Exploration Co., Ltd., a pilot mill with capacity of 150 tons a day, commenced test production for pyrochlore. Exploration and drilling of the ore body continued at this property and power-supply problems were investigated. Metallurgical tests indicated that a successful high grade columbium concentrate can be made.

At the Kiverwa Tin mine, near the Uganda border, work on the new 1,000 ton per day mill continued, but wolframite production in this area dwindled to nothing, reflecting a decrease in world tungsten prices.

Most significant feature of 1957 was the detailed prospecting following extensive aerial surveys carried out in 1956. A 34,000 square-mile concession was granted to Western Rift Exploration Co. Ltd. and copper mineralization in the Sango-Karema area was examined, also the Nguala carbonatite.

New Consolidated Goldfields Ltd. studied monazite occurrences in Morogoro district and copper-gold mineralization at Mara.

TUNISIA

On the whole, activity in the Tunisian mining industry was relatively stable in 1957. A new and small increase in production of iron ore took place. Exports reached 1,182,180 tons, compared with 1,156,710 tons in 1956. England received 64 percent of the ore shipped from Tunisia.

The decrease in production of lead and zinc continued during the year, although some improvement is expected in 1958. Lead production was 37,180 tons compared with 38,700 tons in 1956, and zinc output totaled 6,602 tons compared with 8,870 tons in 1956.

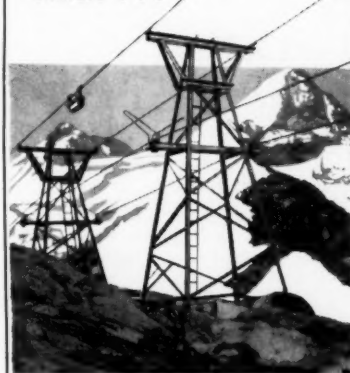
Production of calcium phosphate showed a slight decrease—2,067,325 tons, compared with 2,076,822 in 1956. Most of this is shipped to France. Production of superphosphate was 99,255 tons, compared with 104,326 in 1956. Mercury production ceased.

UGANDA

With the first full year's production of copper from Kilembe Mines, Limited the value of mineral production in Uganda in 1957 exceeded £1,000,000 for the first time. The value of production of the only other important mineral, wolframite, was £141,000 for the first nine months of the year. During the year the Government fixed price contracts for wolframite expired and were not renewed. The market price fell so wolframite mines were faced with the necessity for producing much higher grade ore or reducing working costs drastically. Some wolframite continued to be mined during the latter part of the year but no ore was sold at the then current prices.

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Comparative Value of Mineral Production in Uganda in 1954, 1955, 1956, and 1957. Expressed in Thousands of Pounds (£)

Commodity	1954	1955	1956	1957 ¹
Gold	6	5	3	2
Lead (Conc.)	6	5	11	4
Salt	40	53	51	52
Wolfram Tungsten	147	112	128	141
Tin	58	49	18	30
Niobium Tantalum	24	15	4	4
Beryl	4	19	13	9
Apatite (Phosphate)	7	8	8	14
Copper (Blister)	—	—	41	1500
Total	292	266	277	1756

1. Estimated.

The first full year's production of copper at Kilembe was very satisfactory, and an increase in tonnage handled is scheduled for 1958. Plans call for an extension to the milling capacity to handle 60,000 tons of ore a month.

Satisfactory results were obtained during 1957 from exploration by Unicorn Mines Ltd. to cover the extent of the lead ore zone at the Kitaka mine.

Work continues at the Sukulu Mines Limited's pilot plant and production plans now call for a minimum recovery of 400,000 tons of apatite concentrates annually. A pilot plant for the production of large scale samples of columbium concentrates is scheduled for opening in mid-1958.

UNION OF SOUTH AFRICA

1957 gold output again set new record levels, due to the further expansion of operations by the new mines of the Free State and Klerksdorp fields, and a further improvement in the grade. The latter was derived from greater beneficiation through extended sorting and, in some cases, the mining of higher grade ore facilitated by the extension of underground operations. Most of these new mines, as well as West Driefontein and Doornfontein, have entered or are entering the second phase of productive operations in programs involving the sinking of additional hoisting and/or ventilation shafts, improving the ventilation flow otherwise (by winzes and/or refrigeration), extending stope faces, and expanding the milling rate. For the most part, development ore still constituted an abnormally high proportion of the mill feed tonnage, but this can be expected to become normalized as operations approach the projected capacity rates, with possible benefits reflected in the grade treated.

Uranium oxide output in 1957 advanced further and while there may be a levelling-off this year, a further increase is expected. With the removal of security restrictions, it was announced that the country's indicated ore reserves are 1,100,000,000 tons of ore with a content of about 370,000 tons of U₃O₈; equivalent to about 60 years of continuous output at the annual rate of 6,000 tons of oxide a year. Improved leaching has been effected by raising the pulp temperature in the leach-tanks while improved gold recovery has resulted from extracting the uranium oxide first, and then the gold, instead of vice versa.

Diamond output and the caratage sold declined last year but prices, especially

Metal and Mineral Production for the Union of South Africa in 1953, 1954, 1955, 1956, and 1957*

Commodity	1953 Production	1954 Production	1955 Production	1956 Production	1957 Production	1957 Value
Gold ²	11,940,616	13,237,119	14,601,404	15,896,693	17,031,690	\$212,596,791
Diamonds ³	2,717,020	2,891,264	2,628,917	2,585,728	2,578,975	14,459,745
Silver ²	1,193,152	1,320,060	1,461,336	1,582,045	1,767,472	581,593
Osmiridium ²	6,966	6,482	7,094	6,586	5,361	120,981
Copper ¹	39,844	49,134	49,239	51,253	50,959	10,234,984
Tin ¹	2,400	2,827	2,147	2,887	2,915	822,780
Antimony conc. ¹	4,273	16,277	24,834	24,897	17,546	845,092
Beryl ore ¹	513	192	137	133	711	71,135
Bismuth ore ¹	1	1	0.16	580	220	19,052
Chrome ore ¹	798,567	503,955	597,372	690,855	733,616	3,604,717
Iron ore ¹	2,172,346	2,060,501	2,203,429	2,275,487	2,293,103	1,492,849
Lead ore ¹	706	230	758	1,340	1,835 ⁴	100,276
Manganese ore ¹	912,339	594,517	649,475	768,400	787,883	5,310,136
Tungsten conc. ¹	421	573	646	304	262	72,444
Andalusite ¹	11,772	14,152	19,359	30,244	17,799	71,144
Asbestos ¹	94,817	102,455	119,698	136,521	157,465	9,542,060
Barite ¹	2,092	2,058	1,892	2,713	3,369	12,706
Corundum ¹	1,865	1,443	834	2,068	1,546	26,823
Fluorspar ¹	16,029	14,262	32,839	35,065	35,106	211,790
Graphite ¹	413	1,164	1,829	1,862	1,750	16,101
Kaolin ¹	8,719	13,474	11,275	11,621	15,823	34,575
Magnesite ¹	25,229	22,479	19,753	33,485	35,414	67,363
Mica ¹	2,147	4,556	3,914	2,520	2,431	24,207
Talc ¹	7,974	7,413	1,581	1,968	2,314	6,835
Vermiculite ¹	33,544	44,006	47,904	58,717	62,619	364,824
Platinum group metals ²	299,117	270,885	381,732	484,574	—	8,500,000 ⁶
Lithium ore ¹	60	57	426	713	40	—
Pyrite ¹	103,446	236,513	398,849	481,560	434,802	1,298,662
Uranium	—	—	—	—	11,398,214	49,305,753
Monazite conc. ¹	—	—	—	—	—	682,879

* Records of the Government Mining Engineer. Value does not always accurately reflect production because in one year all production may not be sold; in another year sales may include previous year's production. 1. Short tons. 2. Fine ounces. 3. Metric carats. 4. Metal and concentrate. 5. Estimated. 6. Estimated.

of gems, were more than maintained, due to continued demand and the overall inadequate output available, particularly of gems. Since the turn of the year, however, prices have eased slightly and, it is assumed, the demand also. In 1957, the De Beers group extended diamond prospecting on the Namaqualand coast, Cape Province, where about 20,000 claims were scheduled for proclamation, with extensions projected, and prospecting initiated. Operations will be conducted on a Government lease with 40 percent of the profits plus ruling taxation of the balance accruing to the State. In the Kimberley mines of the group, the decline in grade at depth has, it is understood, persisted. Block-caving methods of mining are being extended further in these mines, and the group is erecting a new treatment and recovery plant, expected to be commissioned soon.

As far as can be estimated, the recession in the platinum metal market had little effect on the overall 1957 returns. This should be reflected in the current year's figures. Last year, Rustenburg Platinum Mines sunk its fourth shaft to a depth of about 1,500 feet, part of an expansion program which was supplemented by further extensions to the treatment plant capacity to 2,600,000 from 2,200,000 tons annually, but under present conditions, the additional capacity will not be commissioned until metal market trends improve. Output will be reduced to about 60 percent of the 1956/57 figure. Subject to final signature, the Rustenburg company has increased its mining lease area by 5,166 claims.

Output by the Northwestern Cape manganese producers was maintained in 1957. Increased sales were met from accumulated stocks, and resulted from a slightly better rail transport position. Consolidation, extension of holdings, development of new mines or quarries, and the proving of additional deposits or extensions were advanced further. In the Postmasburg district, a number of small producers have been amalgamated. Domestic production of ferro-manganese was increased, and new producing units are being erected or are projected by

independent and other companies associated with the major manganese ore producers.

Projected reduction of copper output was not reflected in last year's returns and should become evident this year. Extension of copper interests was again considerable. Palabora Mining Company was formed by Newmont Mining Corporation, Rio Tinto, and the Merensky Trust to explore the extensive low-grade copper deposit extending into the property of Phosphate Development Corporation, in the Northeastern Transvaal. The Messina company extended its mineral holdings considerably in Southern Rhodesia, including copper-lead-zinc, copper, scheelite, limestone, and acquired a substantial shareholding in Rhodesian Iron and Steel Co. (Private) Ltd. The O'okiep Copper Co. announced a 10 percent reduction in copper output, and effected sales of byproduct bismuth ore. Its staff was diverted to exploration and development. Preliminary exploration was initiated on sites of ancient copper workings east of Potchefstroom, Western Transvaal. African Metals Corporation obtained encouraging results in its investigation of the Northern Transvaal Copper Company's property near Messina.

Other points of interest were the reversion of its flotation plant by the Phosphate Development Corporation to phosphate ore treatment, following concentrating tests on its low-grade copper ore; additional claims acquired by Consolidated Murchison (the antimony producer) which has already secured positive results from its extensive underground exploratory development programs; small-scale production started by Minerals Engineering Company from its Marico-Zeerust vanadium deposits, and its commissioning a pilot-plant refinery at Witbank, both in the Transvaal; erection started by Umgababa Minerals of its large-scale concentrating plant on the Natal South Coast for producing ilmenite, zircon, and rutile; pilot-plant production of molybdenite concentrate by Montrose Exploration Company which also increased chromite production.

MINING WORLD Lists

Possible Markets—

Ores — Metals — Non-Metallics

—AS COMPILED FROM LISTS FURNISHED BY
THE DIVISION OF MINERALS, U. S. BUREAU OF MINES,
AND ORE AND METAL BUYERS

ANTIMONY

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Associated Metals & Minerals, 75 West St., New York 6, N. Y.
Derby & Co., Inc., 10 Cedar St., New York 5, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Goldsmith Bros. Smelting & Refining Co., 1300 W. 59th Street, Chicago 36, Ill.
Harshaw Chemical Co., 1945 E. 97th Street, Cleveland 6, Ohio
Intercontinental Metal Corp., 607 Fifth Avenue, New York 17, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
McGeen Chemical Co., 1040 Midland Building, Cleveland 15, Ohio
Metal & Thermit Corp., 100 E. 42nd Street, New York 17, N. Y.
Metal Traders, Inc., 67 Wall Street, New York 5, N. Y.
Metro Smelting Co., Ontario & Bath Sts., Philadelphia 34, Pa.
National Lead Co., 111 Broadway, New York 6, N. Y.
Phillips Brothers, Inc., 70 Pine Street, New York 5, N. Y.
South American Mineral & Merchandising Corp., 445 Park Avenue, New York 22, N. Y.
Southern Lead Co., 2800 W. Moreland St., Dallas, Tex.
C. Tennant, Sons & Co., 100 Park Avenue, New York 17, N. Y.
Nathan Trotter & Co., 36 North Front Street, Philadelphia 6, Pa.
Wah Chang Corporation, Woolworth Building, New York 7, N. Y.
Watson Gench & Co., 25 Broadway, New York 4, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

ASBESTOS

American Asbestos Textile Corp., Strawbridge & Sterigere Sts., Norristown, Pennsylvania
Asbestos Textile Co., Inc., 165 W. Wacker Drive, Chicago 1, Illinois
Asten Hill Mfg. Co., Henry & Roberts Avenue, Philadelphia, Pennsylvania
Carolina Asbestos Co., Davidson, North Carolina
Ehret Magnesia Mfg. Co., Valley Forge, Pennsylvania
Garlock Packing Co., 250 Main Street, Palmyra, New York
International Bartering Co., 52 Broadway, New York 4, N. Y.
Johns Manville Sales Corp., 22 E. 40 Street, New York 16, New York
Keasbey & Mattison Co., Ambler, Pennsylvania
Mandel Cork Corp., 7101 Tonnelle Ave., North Bergen, New Jersey
Pabco Products, Inc., 1550 Powell Street, Emeryville, California
The Philip Carey Mfg. Co., 1935 Easton Blvd., Lockland, Cincinnati 15, Ohio
The Ruberoid Co., South Bound Brook, New Jersey
Russell Mfg. Co., Middletown, Connecticut
Southern Asbestos Co., P. O. Box 968, Charlotte 1, North Carolina
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Union Asbestos & Rubber Co., 332 South Michigan Ave., Chicago 4, Illinois
U. S. Rubber Co., 1232 Ave. of the Americas, New York, New York
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

BARITE GRINDERS

(Possible Buyers of Crude Barite)

Acme Barite Co., Mineral Point, Mo.
Barium Products, Ltd., P. O. Box 920, Modesto, Calif.
Barold Sales Division, National Lead Co., P. O. Box 1675, Houston 1, Texas
The Glidden Co., Chemical & Pigment Division 766 50th Ave., Oakland 1, Calif.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Industrial Minerals & Chemical Co., Sixth and Gilman Sts., Berkeley, Calif.
Macco Corp., 14109 S. Paramount Blvd., Paramount, Calif.
Magnet Cove Barium Corp., P. O. Box 6564, Houston 5, Texas
Mobar Corp., Mineral Point, Mo.
Super Bar Co., Mineral Point, Mo.
C. K. Williams & Co., 2001 Lynch Ave., East St. Louis, Ill.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible buyers of Crushed or Ground Barite for Use in Glass)

Anchor-Hocking Glass Co., 109 N. Broad St., Lancaster, Ohio
Ball Bros., Ryan and Burt Sts., Muncie, Ind.
Brookway Glass Co., Brooklyn, Pa.
Buck Glass Co., Fort and Silica Sts., Baltimore, Md.
Commercial Glass Co., Fairmont, W. Va.
Diamond Glass Co., Royersford, Pa.
Foster-Forbes Glass Co., Marion, Ind.
Hazel-Atlas Glass Co., 1942 Danneburg St., Wheeling, W. Va.
A. H. Kerr & Co., Sand Springs, Okla.
Litchford-Marble Glass Co., P. O. Box 4707, Los Angeles, Calif.
Owens-Illinois Glass Co., Duraglass Bldg., Toledo, Ohio
Owens-Illinois Pacific Coast Co., 135 Stockton St., San Francisco, Calif.
Sterling Glass Co., Dapel, Ind.
Thatcher Manufacturing Co., Elmira, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible Buyers of Ground Barite for Use in Paint)

Amalgamated Paint Co., Inc., Pier 11, North River, New York, N. Y.
Armstrong Cork Co., 1010 Concord St., Lancaster, Pa.
Atlantic Paint & Varnish Works, Wilmington, N. C.
Baker Paint & Varnish Co., 224 Snydam Ave., Jersey City, N. J.
E. S. Browning Co., 1515 Third St., San Francisco, Calif.
C. E. Butler Co., 2868 Hanna St., Oakland 8, Calif.

Clement Coverall Co., 615 Van Hook St., Camden, N. J.
Fisher Thorsen & Co., Inc., 2100 N. W. 22nd Ave., Portland 10, Ore.
W. P. Fuller & Co., 301 Mission St., San Francisco, Calif.
General Paint Corp., 2627 Army St., San Francisco 19, Calif.
U. S. Gypsum Co., 300 W. Adams St., Chicago, Ill.
Wesco Waterpaints, Fifth and Grayson Sts., Berkeley 2, Calif.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Possible Buyers of Crude Barite for Use in Barium Chemicals)

Barium Products Ltd., P. O. Box 920, Modesto, Calif.
Barium Reduction Corp., Drawer 1, South Charleston, W. Va.
Chicago Copper & Chemical Co., Blue Island, Ill.
Mallinckrodt Chemical Works, St. Louis, Mo.
Standard Ultramarine & Color Co. Box 2166, Huntington 18, West Va.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

BENTONITE

(Possible Buyers of Crude and Ground)

Abbott Laboratories, North Chicago, Ill.
American Colloid Co., Merchandise Mart Plaza, Chicago 54, Ill.
Atlantic Refining Co., 260 S. Broad St., Philadelphia, Pa.
Barold Sales Div., National Lead Co., P. O. Box 1675, Houston 1, Texas
Barnsdall Refineries, Inc., 61 E. Van Buren St., Chicago, Ill.
Bradford Oil Refining Co., Bradford, Pa.
Cities Service Refining Co., Boston, Mass.
Commercial Minerals Co., San Francisco, Calif.
Charles B. Crystal Co., Inc., 53 Park Place, New York, N. Y.
Eastern Clay Products, Inc., 223 1/2 Main St., Jackson, Ohio
Filtrol Corp., 634 So. Spring St., Los Angeles 14, Calif.
Great Lakes Foundry Sand Co., 700 United Artists Bldg., Detroit, Mich.
Gulf Refining Co., 260 S. Broad St., Phila., Pa.
Hammill & Gillespie, Inc., 225 Broadway, New York 7, N. Y.
Harshaw Chemical Co., 47 Ann St., New York 7, N. Y.
Pure Oil Co., 35 E. Wacker Dr., Chicago, Ill.
Quaker State Oil Corp., Emlenton, Pa.
Ranger Chemical Corp., P. O. Box 1765, Houston 1, Texas
Richfield Oil Corp. of New York, Chanin Bldg., New York, N. Y.
United Clay Mines Corp., 109 Oakland St., Trenton, N. J.
Western Clay and Metals Co., 1 So. 2nd St., Alabama, Calif.
Western Clay Products Co., P. O. Box 231, Houston, Texas
Western Talc Co., 1901 E. Slauson Ave., Los Angeles 11, Calif.
Witco Chemical Co., 47 Ann St., New York 7, N. Y.

BERYL

Beryllium Corp., P. O. Box 1462, Reading, Pa.
Beryl Ores Co., P. O. Box 409, Rouse 1, Arvada, Colo.
Brush Beryllium Co., 4301 Perkins Ave., Cleveland 3, Ohio
Derby and Co., Inc., 10 Cedar St., New York 5, N. Y.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Metaburg, Inc., 100 Park Ave., New York 17, N. Y.
Phillip Bros. Inc., 20 Pine St., New York 5, N. Y.
Frank Samuel and Co., Inc., Lincoln Liberty Bldg., Philadelphia 7, Pa.
A. O. Smith Corp., 3533 N. 27th St., Milwaukee 16, Wisc.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
Note: Domestic beryl is also purchased at Government buying depots at Custer, S. Dak., Franklin, N. H., and Spruce Pine, N. C.

BISMUTH

(Metal)

American Metal Co., Ltd., 61 Broadway, New York 6, N. Y.
American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
The Anacoda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
J. T. Baker Chemical Co., Phillipsburg, N. J.
Belmont Smelting & Refining Works, Inc., 330 Belmont Ave., Brooklyn, N. Y.
Cerro de Pasco Corp., 300 Park Ave., New York 22, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Mallinckrodt Chemical Works, 2nd & Mallinckrodt Streets, St. Louis 7, Mo.
Merek & Co. Inc., Rahway, N. J.
National Lead Co., 111 Broadway, New York 6, N. Y.
Norwich Pharmacal Co., 17 Eaton Avenue, Norwich, N. Y.
Charles Pfizer & Co., Inc., 11 Barlett Street, Brooklyn 6, N. Y.
U. S. Metals Refining Co., 61 Broadway, New York 6, N. Y.
U. S. Smelting Refining & Mining Co., 75 Federal St., Boston 6, Mass.

CADMIUM

American Metal Co., Ltd., 61 Broadway, New York 6, N. Y.
American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
American Zinc, Lead and Smelting Co., 1600 Paul Brown Bldg., St. Louis, Mo.
The Anacoda Co., 25 Broadway, New York, N. Y.

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 The Bunker Hill Co., Kellogg, Idaho
 Chemical and Pigment Co. (Div. of the Glidden Co.), 2701 Broening
 Highway, Baltimore 22, Maryland.
 Eagle Picher Co., (Mining and Smelting Div.), P. O. Box 910, Miami,
 Okla.
 Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 International Minerals and Metals Corp., 11 Broadway, New York 6,
 N. Y.
 International Smelting and Refining Co., International Utah.
 New Jersey Zinc Co., 160 Front St., New York 38, N. Y.
 Sherwin-Williams Co., Ozark Smelting & Mining Div., 101 Prospect Av.,
 N.W., Cleveland 1, Ohio.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

CHROME ORE

(Metallurgical Ore Users)

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Baltimore Works, Armco Steel Corp., 3400 E. Chase St., Baltimore 13,
 Md.
 Electro-Metallurgical Corp., 30 E. 42nd St., New York 17, N. Y.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Keokuk Electro-Metals Co., Keokuk, Iowa
 Montana Ferroalloys, Inc., P. O. Box 1100, Memphis, Tenn.
 Ohio Ferro-Alloys Corp., 839 30th St. N.W., Canton 9, Ohio
 Pacific Northwest Alloys, Inc., P. O. Box 6247, Hillyard Station, Spo-
 kane, Wash.
 Pittsburgh Metallurgical Co., Niagara Falls, N. Y.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 Tennessee Products & Chemical Corp., 500 First American National
 Bank Bldg., Nashville 3, Tenn.
 Universal Cyclops Steel Corp., Bridgeville, Pa.
 Vanadium Corporation of America, 420 Lexington Ave., New York 17,
 N. Y.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Chemical Ore Users)

Columbia-Southern Chemical Corp., 902 Garfield Ave., Jersey City 5,
 N. J.
 Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio
 Diamond Alkali Co.-Kearny Plant, Belleville Turnpike, Kearny, N. J.
 Foote Mineral Co., Inc., 10 E. Chelton Ave., Philadelphia 44, Pa.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Imperial Paper & Color Corp., Glens Falls, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Mutual Chemical Div., Allied Chemical & Dye Corp., 99 Park Ave., New
 York 16, N. Y.
 Frank Samuel & Co., Inc., Lincoln-Liberty Bldg., Philadelphia 7, Pa.
 Solvay Process Div., Allied Chemical & Dye Corp., P.O. Box 271,
 Syracuse, N. Y.

(Refractory Ore Users)

Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, Ohio
 Eastern Stainless Steel Corp., Baltimore 3, Md.
 General Refractories Co., 1520 Locust St., Philadelphia, Pa.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh 22,
 Pa.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland 12, Calif.
 E. J. Lavino & Co., 3 Penn Center Plaza, Philadelphia 2, Pa.
 Frank Samuel & Co., Inc., Lincoln-Liberty Bldg., Philadelphia 7, Pa.
 U. S. Steel Corp., 325 William Penn Place, Pittsburgh 30, Pa.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

COBALT

Ceramic Color & Chemical Mfg. Co., New Brighton, Pa.
 Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Kennametal, Inc., Latrobe, Pa.
 Metallurgical Resources, Inc., Newburgh, N. Y.
 The Pyrites Co., Wilmington, Del.
 The O. Hommel Co., Carnegie, Pa.
 Shepherd Chemical Co., Highland Avenue, Cincinnati 12, Ohio.

COLUMBITE-TANTALITE

African Metals Corp., 25 Broad St., New York 4, N. Y.
 J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
 Derby & Co., 10 Cedar St., New York 5, N. Y.
 Electro Metallurgical Division of Union Carbide and Carbon Corp., 30
 E. 42nd St., New York 17, N. Y.
 Fansteel Metallurgical Corp., N. Chicago, Ill.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Kennametal, Inc., Latrobe, Pa.
 Kaweck Chemical Co., Boyertown, Pa.
 Mallinckrodt Chemical Works, 2nd & Mallinckrodt St., St. Louis 7, Mo.
 Metal Hydrides, Inc., 12-21 Congress St., Beverly, Mass.
 Standard Ore & Alloys Corp., 120 Wall St., New York 5, N. Y.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 Wah Chang Corp., Woolworth Bldg., New York 7, N. Y.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

COPPER

American Metal Co., Ltd., Carteret, N. J.
 American Smelting & Refining Co., El Paso, Tex., Garfield, Utah, Hay-
 den, Ariz., Tacoma, Wash.
 The Anaconda Co., Anaconda, Mont.
 Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Inspiration Consolidated Copper Co., Inspiration, Ariz.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
 International Smelting & Refining Co., Miami, Ariz.
 Magma Copper Co., Superior, Ariz.

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San Luis Potosi, S.L.P., Mexico

ZINC SMELTERS

Amarillo, Texas
Corpus Christi, Texas
Rosita, Coah., Mexico

COPPER SMELTERS

Hayden, Arizona
El Paso, Texas
Garfield, Utah
Tacoma, Washington
San Luis Potosi, S.L.P., Mexico

LEAD REFINERIES

Selby, California
Omaha, Nebraska
Perth Amboy, New Jersey
Monterey, N.L., Mexico

COPPER REFINERIES

Baltimore, Maryland
Perth Amboy, New Jersey
Tacoma, Washington

See management
at above locations
or write to main office,
American Smelting and
Refining Company,
Ore Purchasing Department,
120 Broadway,
New York 5, N. Y.

ASARCO

Phelps Dodge Refining Corp., Laurel Hill, N. Y.
Phelps Dodge Corp., Douglas, Ariz., Morenci, Ariz., Ajo, Ariz.
C. Tennant, Sons & Co., 180 Park Ave., New York 17, N. Y.
Tennessee Copper Co., Copperhill, Tenn.

DIATOMITE

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.
A. Daigger & Co., 161 West Kinzie St., Chicago, Ill.
General Refractories Co., 1518 Locust St., Philadelphia, Pa.
B. F. Goodrich Co., 440 S. Main St., Akron, Ohio
Hygeia Filter Co., 3422 Denton St., Detroit, Michigan.
Industrial Minerals & Chemical Co., 836-38 Gilman St., Berkeley, Calif.
Marshall Dill Division, WhittCo Chemical Co., 39 Blaxome St., San Francisco, Calif.
National Filter Media Co., Sales Div. of Filter Media Corp., 1719 Dixwell Ave., New Haven, Conn.
Standard Asbestos Mfg. & Insulating Co., 410 Olive St., Kansas City, Mo.

FELDSPAR

(Possible Buyers of Crude, Crushed, or Ground)

Akron Porcelain Co., Kenmore Station, Akron, Ohio
Ball Brothers Co., Muncie, Ind.
Corning Glass Works Co., 1943 Crystal St., Corning, N. Y.
Donnelly-Kelley Glass Co., 49 Fenlon St., Holland, Mich.
Federal Glass Co., Columbus, Ohio
General Ceramics Co., 30 Rockefeller Plaza, New York, N. Y.
Hazel-Atlas Glass Co., 1942 Dannelberg St., Wheeling, W. Va.
Knox Porcelain Corp., 150 Mynders St., Knoxville, Tenn.
Marietta Mfg. Corp., 4000 E. 15th St., Indianapolis, Ind.
Owens-Illinois Glass Co., Toledo, Ohio
Porcelain Products Co., Inc., 1941 Broadway, Parkersburg, W. Va.
Star Porcelain Co., Muirhead & Dewey Aves., Trenton, N. J.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Trenton Potteries Co., Inc., Trenton, N. J.
Wellville China Co., Wellsville, Ohio

FLUORSPAR

(Brokers or Selling Agents)

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Balfour, Guthrie & Co., Los Angeles, Calif.
Bauer-Wilson & Bateman, 135 S. LaSalle St., Chicago, Ill.
Continental Ore Co., 590 Fifth Ave., New York City.
E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington, Del.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Hickman, Williams & Co., Clark Bldg., Pittsburgh, Pa.
Kerchner, Marshall & Co., Oliver Bldg., Pittsburgh, Pa.
E. J. Lavino & Co., 1524 Walnut St., Philadelphia, Pa.
Mercantile Import & Export Corp., 21 East 40th St., New York City.
Mercantile Metal & Ore Corp., 60 Wall St., New York City.
Miller-Adick Co., Carew Tower, Cincinnati, O.
Oglebay Norton & Co., Hanna Bldg., Cleveland, O.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

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GERMANIUM

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
The American Steel and Wire Div., United States Steel Corp., Rockefeller Bldg., Cleveland 13, Ohio.
American Zinc, Lead and Smelting Co., 818 Olive St., St. Louis, Mo.
Eagle Picher Co., Mining and Smelting Div., First Nat. Bank Bldg., Miami, Okla.
Sylvania Electric Products, Inc., Towanda, Pa.

GRAPHITE

The Asbury Graphite Mills, Inc., 41 Main St., Asbury, N. J.
Cummings-Moore Graphite Co., 1646 Green Ave., Detroit 9, Mich.
Joseph Dixon Crucible Co., 167 Wayne St., Jersey City 3, N. J.
Charles Pettinos, Inc., 1 E. 42nd St., New York 17, N. Y.
Superior Graphite Co., 33 S. Clark St., Chicago 3, Ill.
United States Graphite Co., 1621 Holland Ave., Saginaw, Mich.

IRON ORE

Acme Steel Co., Newport, Kentucky.
Alan Wood Steel Co., Conshohocken, Pa.
Armco Steel Corp., Middletown, Ohio.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Bethlehem Steel Company, Bethlehem, Pa.
Columbia-Geneva Steel Div., U. S. Steel Corp., 120 Montgomery, San Francisco, Calif.
Colorado Fuel & Iron Corp., Pueblo, Colorado.
Crucible Steel Co. of America, P. O. Box 88, Pittsburgh 30, Pa.
Detroit Steel Corp., Portsmouth, Ohio.
Eastern Gas & Fuel Assoc., 250 Stuart St., Boston, Mass.
Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Granite City Steel Co., Box 367, Granite City, Ill.
Hanna Furnace Corp., Grant Bldg., Pittsburgh, Pa.
Inland Steel Co., 3210 Watling St., E. Chicago, Indiana.
Interlake Iron Corp., 1900 Union Commerce Bldg., Cleveland 14, Ohio.
International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.
Jones & Laughlin Steel Corp., 401 Liberty Ave., Gateway Center, Pittsburgh 30, Pa.
Kaiser Steel Corp., P. O. Box 217, Fontana, Calif.
Lone Star Steel Co., P. O. Box 8087, Dallas 5, Tex.
National Steel Corp., Grant Bldg., Pittsburgh, Pa.
Pittsburgh Steel Co., Grant Bldg., Pittsburgh, Pa.
Republic Steel Corp., Republic Bldg., 25 Prospect Ave., N. W. Cleveland 1, Ohio.
Sharon Steel Corp., Sharon, Pa.
Shenango Furnace Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal & Iron Div., U. S. Steel Corp., P. O. Box 599, Fairfield, Ala.
T. S. Pipe & Foundry Co., Birmingham, Ala.
U. S. Steel Corp., 525 Wm. Penn Place, Pittsburgh 30, Pa.
Wheeling Steel Corp., Wheeling, West Virginia.
Woodward Iron Company, Woodward, Ala.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown 1, Ohio.

LEAD

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
American Metal Company, Ltd., 61 Broadway, New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
The Bunker Hill Co., Kellogg, Idaho.
Combined Metals Reduction Co., Felt Bldg., Salt Lake City, Utah.
The Consolidated Mining & Smelting Co., Ltd., Montreal, Canada.
Eagle Picher Co., Mining and Smelting Div., P. O. Box 910, Miami, Okla.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Smelting & Refining Co., 25 Broadway, New York 4, N. Y.
Metal Traders, Inc., 67 Wall St., New York, N. Y.
National Lead Company, 111 Broadway, New York, N. Y.
Phillips Brothers, Inc., 70 Pine St., New York 5, N. Y.
St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
United States Smelting Refining & Mining Co., 75 Federal St., Boston, Mass.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

LEPIDOLITE

American Potash & Chemical Corp., 3030 W. 6th St., Los Angeles 51, Calif.
Corning Glass Works, Corning, N. Y.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
General Electric Co., Nela Park, Cleveland, Ohio.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
Pittsburgh Corning Corp., Port Allegany, Pa.

MAGNESITE AND BRUCITE

Basic, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.
Corhart Refractories Co., (Corning Glass Works), 1662 West Lee St., Louisville, Ky.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.
Northwest Magnesite Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
Pabco Products Inc., 1550 Powell St., Emeryville 8, Calif.
Standard Lime & Cement Co., 2000 First National Bank Bldg., Baltimore, Md.
Standard Slag Co., 1200 Wick Bldg., Youngstown 1, Ohio.
Westvaco Chemical Division, Food Machinery & Chemical Corp., 161 E. 42nd St., New York, N. Y.

MANGANESE ORE

(Metallurgical-grade)

Associated Metal & Minerals Corp., 75 West St., New York 6, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Colorado Fuel and Iron Corp., Pueblo, Colorado.
Electro Manganese Div., Foote Mineral Co., Knoxville, Tenn.
Electro Metallurgical Co., A Division of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Keokuk Electro Metals Co., Keokuk, Iowa.
National Paint and Manganese Co., Lynchburg, Virginia.
Ohio Ferro-Alloys Corp., 100 Citizens Bldg., Canton, Ohio.

Pittsburgh Metallurgical Co., Niagara Falls, New York.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 Tennessee Products and Chemical Corp., American National Bank Bldg.,
 Nashville Tennessee.
 Tenn-Tex Alloy and Chemical Corp., 500 1st American National Bank
 Bldg., Nashville 3, Tenn.
 United States Steel Co., 525 William Penn Place, Pittsburgh 30, Pa.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Battery and Chemical-grade)

Acme Battery Co., 200 Henry St., Stamford, Conn.
 Burgess Battery Company, Freeport, Ill.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 General Dry Batteries, Inc., Cleveland, Ohio.
 General Electric Co., Nela Park, Cleveland, Ohio.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 E. J. Lavino & Co., 3 Penn Center Plaza, Philadelphia 2, Pa.
 Mallory Battery Co., Div. of F. R. Mallory & Co., Inc., 13000 Athens
 Ave., Cleveland, Ohio.
 National Carbon Co., P. O. Box 6087, Cleveland, Ohio.
 Olin Mathieson Chemical Corp., 225 Winchester Ave., New Haven 4,
 Conn.
 Ray-O-Vac Co., Madison, Wis.
 Tennessee Eastman Corp., Kingsport, Tenn.

MERCURY

Allied Chemical & Dye Corp., The Solvay Process Div., P. O. Box 271,
 Syracuse, N. Y.
 American Cyanamid Co., 36 Rockefeller Plaza, New York 20, N. Y.
 American Meter Co., Erie, Pa.
 Automatic Steel Products, Inc., Mercury Clutch Div., 1291 Camden Ave.,
 S. W., Canton 6, Ohio.
 Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Bailey Meter Co., 1052 Ivanhoe Rd., Cleveland 10, Ohio.
 J. T. Baker Chemical Co., Phillipsburg, N. J.
 F. W. Berk & Co., Inc., Woodbridge Div., Box 38, Woodridge, N. J.;
 Coast Chem. Div., 275 Brannon St., San Francisco, Cal.
 E. I. du Pont de Nemours & Co., Inc., Methods Div., Du Pont Bldg.,
 Wilmington 98, Del.
 Foxboro Co., Foxboro, Mass.
 General Aniline & Film Corp., General Aniline Works Div., 435 Hudson
 St., New York 14, N. Y.
 General Color Co., 24 Avenue B, Newark 5, N. J.
 General Electric Co., Purchasing Dept., 1 River Road, Schenectady 5,
 N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
 Mallinckrodt Chemical Works, Jersey City 5, N. J.
 Mathieson Chemical Co., Baltimore, Md.
 Merck & Co., Inc., Lincoln Ave., Rahway, N. J.
 The Mercol Corp., 4201 Belmont Ave., Chicago 41, Ill.
 Metallists Corp., 200 Wagar Rd., Hawthorne, N. J.
 Minneapolis Honeywell Regulator Co., 2753 4th Ave. S., Minneapolis 8,
 Minn.; Brown Instrument Div., 4331 Wayne Ave., Philadelphia, Pa.
 Phillips Petroleum Co., Bartlesville, Okla.
 Public Service Electric & Gas Co., Electric Dept., 80 Park Place,
 Newark 1, N. J.
 Quicksilver Products Inc., 407 Sansome St., San Francisco 11, Calif.
 Thomas A. Edison, Inc., Primary Battery Div., Bloomfield, N. J.
 Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, N. J.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.
 Wyandotte Chemical Corp., Wyandotte, Mich.

MICA

(Buyers of Muscovite Block, Film Mica, and Phlogopite Block Mica)

Aerovox Division, Aerovox Corp., 740 Belleville Ave., New Bedford,
 Mass.
 American Mica Insulation Co., 235 Parker Ave., Manassas, N. J.
 Ashville Mica Co., P. O. Box 318, Newport News, Va.
 Carpenter & Phillips, Box 657, Spruce Pine, N. C.
 Cornell-Dubilier Electric Corp., 55 Cromwell St., Providence 7, R. I.
 Diamond Power Specialty Corp., P. O. Box 415, Lancaster, Ohio.
 J. E. DeSousa Co., Inc., 217 Broadway, New York 7, N. Y.
 Farnam Mfg., Inc., Sweeten Creek Road, Asheville, N. C.
 General Electric Co., 1 River Road, Schenectady, N. Y.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Mica Fabricating Company, 53 Central Ave., Rochelle Park, N. J.
 Miceracraft Products, Inc., 701 McCarter Highway, Newark 5, N. J.
 Perfection Mica Co., 20 North Wacker Drive, Chicago, Ill.
 Reliance Mica Co., 341 39th St., Brooklyn, N. Y.
 Spruce Pine Mica Co. and Mayland Mfg. Co., Spruce Pine, N. C.
 The Tar Heel Mica Co., Inc., Plumtree, N. C.
 Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

(Consumers of Mica Splittings)

Allis-Chalmers Manufacturing Co., Box 512 Milwaukee 1, Wisconsin.
 American Electrical Heater Co., 6110 Cass Ave., Detroit, Michigan.
 Cleveland Mica Co., 1360 Hird St., Lakewood, Ohio.
 Continental-Diamond Fibre Co., Valparaiso, Indiana.
 General Electric Co., 1 River Road, Schenectady, N. Y.
 Mica Insulator Company, 757 Broadway, Schenectady, New York.
 National Electric Co., Columbus, Ohio.
 Westinghouse Electric Corp., P.O. Box 472, Irwin, Pa.

MICA GRINDERS

(Buyers of Domestic Scrap Mica)

Concord Mica Corp., 25 Crescent St., Penacook, N. H.—Wet.
 International Minerals & Chemical Corp., 20 North Wacker Drive, Chi-
 cago, Ill.; plants at Kona, N. C., and Erwin, Tenn.
 Deneen Mica Co., Burnsville, N. C.—Dry.
 Diamond Mica Co., Spruce Pine, N. C.—Wet.
 English Mica Co., Spruce Pine, N. C.—Wet and Dry.
 Franklin Miners' Products Co., Box 38, Franklin, N. C.—Wet.
 The Funkhouser Co., Hartwell, Georgia—Dry.
 John Humer, Winterhaven, Calif.
 Kings Mountain Mica Co., Inc., Box 709, Kings Mountain, N. C.—Dry.
 Southern Mica Co., Johnson City, Tenn.—Dry.
 Sunshine Mica Co., 12234 Lea Nietos Road, Los Nietos, Calif.
 Western Nonmetallics, Inc., Pueblo, Colo.—Dry.

MOLYBDENUM CONCENTRATES

J. T. Baker Chemical Co., Phillipsburg, N. J.
 Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
 Crucible Steel Co. of America, Pittsburgh, Pa.
 International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
 Molybdenum Corp. of America, 500 Fifth Ave., New York, N. Y.
 Republic Steel Corp., Canton, Ohio.
 S. W. Shattuck Chemical Co., Denver, Colo.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

NICKEL

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
 Coamo Metal Alloys Co., 275 Front St., New York, N. Y.
 Sulmet Alloys Co., Inc., Wellington St. and Erie R.R., Clifton, N. J.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 United States Smelting Refining & Mining Co., 1 State St., Boston,
 Mass.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

PERLITE

(Producers of Expanded Perlite)

Airlite Processing Corp., Bldg. 9, Air Base, Vero Beach, Fla.
 American Bldrok Co., 2001 W. Pershing Road, Chicago 9, Ill.
 Alatex Construction Service, Inc., 3518 Broadway St., New Orleans 18,
 La.
 Buffalo Perlite Corp., 100 Sugg Road (Cheektowaga), Buffalo 21, N. Y.
 Florida Perlite Co., 285 West 9th St., Hialeah, Fla.
 Great Lakes Carbon Corp., 612 Flower St., Los Angeles 17, Calif.
 Gregg Products Co., 616 Chestnut St., S. W. Grand Rapids, Mich.
 Harborlite Corp., 696 Montgomery Freeway, Chula Vista, Calif.
 McClure & Erickson Corp., 2116 Bedesden Ave., Los Angeles 22, Calif.
 Midwest Perlite Products, Inc., 1120 Railroad St., W. Des Moines, Iowa.
 Minerals Processing Corp., 520 Van Rensselaer St., Syracuse, N. Y.
 Minnesota Perlite Corp., 315 W. 86th St., Minneapolis 20, Minn.
 National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.
 Panacalite Pacific, Inc., 845 E. 60th St., Los Angeles 1, Calif.
 Paramount Perlite Co., 16236 S. Illinois St., Paramount, Calif.
 Supreme Perlite Co., P.O. Box 66, North Portland, Oregon
 Sibirco Corp., 5901 W. 65th St., Chicago 36, Ill.

PLATINUM

The American Platinum Works, 231 New Jersey R. R. Ave., Newark 5,
 N. J.
 Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
 J. Bishop & Co. Platinum Works, Malvern, Pa.
 Handy & Harman, 82 Fulton St., New York 7, N. Y.
 Johnson, Matthey & Co., Inc., 608 Fifth Ave., New York 20, N. Y.
 Mercantile Metal & Ore Corp., 595 Madison Ave., New York 22, N. Y.
 Rodman & Yarusso Refining Co., 21 W. 47th St., New York 19, N. Y.
 Wildberg Bros. Smelting & Refining Co., 742 Market St., San Fran-
 cisco 2, Calif.
 Western Gold & Platinum Works, 589 Bryant St., San Francisco 7,
 Calif.

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The Anaconda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Baugh Chemical Company, Baltimore, Maryland.
Davidson Chemical Corporation, 20 Hopkins Place, Baltimore 3, Maryland.
Foote Mineral Company, 18 West Cheltenham Ave., Philadelphia 44, Pa.
General Chemical Division, Allied Chemical & Dye Corp., P. O. Box 4040, Denver, Colorado.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Reliance Phosphate Company, Savannah, Georgia.
Stauffer Chemical Company, 636 California St., San Francisco 8, Calif.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

RARE-EARTH ORES

(Cerium ores, monazite sand, bastnaesite, other thorium-bearing ores)

Crane Co., 636 Michigan Ave., Chicago 5, Ill.
Davison Chemical Co., Rare Earths Div., P. O. Box 488, Pompton Plains, N. J.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Lindsay Chemical Co., 264 Ann St., West Chicago, Illinois.
Mallinckrodt Chemical Works, 2nd and Mallinckrodt Sts., St. Louis 7, Mo.
Maywood Chemical Works, Maywood, N. J.
Molybdenum Corp. of America, 500 Fifth Ave., New York, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

SELENIUM

American Metal Co., Ltd., 61 Broadway, New York, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 4, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Smelting & Refining Co., 25 Broadway, New York, N. Y.
Kawacki Chemical Co., Boyertown, Pa.

SILICA

(Possible Buyers Exclusive of Glass Manufacturers)

Commercial Minerals Co., 319 Irwin St., San Francisco
Great Lakes Foundry Sand Co., 720 United Artist Bldg., Detroit 26, Mich.
Industrial Minerals and Chemical Co., 836 Gilman, Berkeley, Calif.
Industrial Silica Corp., Stambaugh Bldg., Youngstown, Ohio
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.
Linde Air Products Co., 30 East 42nd St., New York, N. Y.
Minerals and Insulation Corp., 45 Central Ave., Rochelle Park, New Jersey
Silicone Insulation Co., Inc., Butler Place Bronx 61, N. Y.
Tennessee Products & Chemical Corp., 512 First American National Bank Bldg., Nashville, Tenn.

SPODUMENE

Corning Glass Works, Corning, N. Y.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, Pa.
Foote Mineral Co., 18 E. Cheltenham Ave., Philadelphia 44, Pa.
Lithium Corp. of America, Inc., Rand Tower, Minneapolis 2, Minn.
Maywood Chemical Works, Maywood, N. J.
National Enameling and Stamping Co., 270 N. 12th St., Milwaukee, Wis.
Owens Corning Fiberglas Corp., Newark, Ohio.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

STRONTIUM ORES

Associated Metals & Minerals Corp., 40 Rector St., New York, N. Y.
J. T. Baker Chemical Co., Phillipsburg, N. J.
Barium Products, Ltd., Modesto, Calif.
Barium Reduction Corp., Charleston, W. Va.
E. I. du Pont de Nemours & Co., Inc., 11th & Orange Sts., Wilmington, Del.
Foote Mineral Co., Inc., 12 E. Cheltenham Ave., Philadelphia, Pa. (minerals).
General Electric Co., 1 River Road, Schenectady, N. Y.
Chas. Hardy, 415 Lexington Ave., New York, N. Y.
Harshaw Chemical Co., 1933 E. 97th St., Cleveland, Ohio.

TALC

(Producers and Grinders of Crude Talc, Pyrophyllite and Soapstone)

Alberene Stone Corp. of Va., Schuyler, Va.
American Minerals Co., 840 S. Mission Rd., Los Angeles, Calif.
Arkansas Talc Co., Inc., Benton, Ark.
Blue Ridge Talc Co., Inc., Henry, Va.
Carolina Pyrophyllite Co., Staley, N. C.
Commercial Minerals Co., 310 Irwin St., San Francisco, Calif.
Eastern Magnesia Talc Co., Inc., 206 Bank St., Burlington, Vt.
Gouverneur Talc Co., Inc., Gouverneur, N. Y.
Huntley Industrial Minerals, Inc., Box 305 Bishop, Calif.
Industrial Minerals & Chemical Co., 6th & Gilman St., Berkeley, Calif.
Southern Talc Co., Chatsworth, Ga.
Southwestern Talc Corp., Llano, Texas.
Stauffer Chemical Co., P. O. Box 68, N. Portland, Ore.

TANTALITE (SEE COLUMBITE)

TIN

American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
Metal & Thermo Corp., 100 E. 42nd St., New York 17, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Vulcan Detinning Co., Seward, N. J.
Wah Chang Corp., Woolworth Bldg., New York 7, N. Y.

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Dow Chemical Co., Midland, Mich.
 E. I. du Pont de Nemours and Co., Inc., DuPont Bldg., Wilmington 98, Del.
 Electro Metallurgical Co., Div. of Union Carbide and Carbon Corp., Ashtabula, Ohio and 30 East 42nd St., New York 7, N. Y.
 Titanium Metals Corp. of America, 233 Broadway, New York, N. Y.

(Pigment Manufacturers—Ilimenite)

American Cyanamid Co., Pigments Div., 30 Rockefeller Plaza, New York 20, N. Y.
 E. I. du Pont de Nemours and Co., Inc., DuPont Bldg., Wilmington 98, Del.
 The Glidden Co., Chemicals-Pigments-Metals Div., 900 Union Commerce Bldg., Cleveland 14, Ohio
 National Lead Co., 111 Broadway, New York 6, N. Y.
 New Jersey Zinc Co., Gloucester City, N. J.

(Welding Rod Manufacturers—Ilimenite and Rutile)

American Brake Shoe Co., 230 Park Ave., New York 17, N. Y.
 Harnischfeger Corp., 4400 W. National St., Milwaukee, Wis.
 Stoddy Co., Slauson Ave. at Sorenson, Whittier, Calif.
 Westinghouse Electric Corp., Box 2278, Pittsburgh 30, Pa.

(Alloy Manufacturers—Ilimenite and Rutile)

Aluminum Co. of America, 1501 Alcoa Bldg., Washington 6, D. C.
 Titanium Alloy Manufacturing Co., Div. of National Lead Co., Box C, Bridge Station, Niagara Falls, N. Y.
 Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
 Vanadium Corp. of America, 420 Lexington Ave., New York 17, N. Y.

(Dealers—Ilimenite)

L. H. Butcher Co., 3628 Olympia Blvd., Los Angeles 23, Calif.
 J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 Metallurg, Inc., 99 Park Ave., New York 16, N. Y.
 C. Tennant, Sons & Co., 100 Park Ave., New York, N. Y.

(Dealers—Rutile)

Berkshire Chemicals, Inc., 420 Lexington Ave., New York 17, N. Y.
 Derby & Co., 10 Cedar St., New York 5, N. Y.
 J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 International Titanium Corp., 100 Park Ave., New York 17, N. Y.
 Metallurg, Inc., 99 Park Ave., New York 16, N. Y.
 Metal Traders Inc., 67 Wall St., New York 5, N. Y.
 Orefraction Inc., 7425 Thomas St., Pittsburgh 8, Pa.
 Phillip Bros., Inc., 70 Pine St., New York 5, N. Y.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 Wah Chang Corporation, Woolworth Building, New York 7, N. Y.

TUNGSTEN CONCENTRATES

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 Braeburn Alloy Steel Co., Div. of Continental Copper & Steel, Inc., Braeburn, Pa.
 Columbia Tool Steel Co., Chicago Heights, Ill.
 Continental Ore Corp., 509 Fifth Ave., New York 36, N. Y.
 J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
 Derby & Co., 10 Cedar St., New York 5, N. Y.
 Pansteel Metallurgical Corp., 600 Sheridan Road, North Chicago, Ill.
 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
 General Electric Co., Cleveland Wire Works, Lamp Dept., 1331 Chardon Road, Euclid 17, Ohio.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 Jessop Steel Co., Washington, Pa.
 Kennametal, Inc., Latrobe, Pa.
 Latrobe Steel Co., Latrobe, Pa.
 Metallurg, Inc., 99 Park Ave., New York, N. Y.
 Molybdenum Corp. of America, 500 5th Ave., New York, N. Y.
 North Metal and Chemical Co., York, Pa.
 Reading Chemical Co., Box 53, Wyomissing, Pa.
 Reduction and Refining Co., Kenilworth, N. J.
 Salt Lake Tungsten Co., 2160 Indiana Ave., Salt Lake City, Utah.
 Simonds Saw and Steel Co., Lockport, N. Y.
 Sylvania Electric Products Co., Tungsten & Chemical Division, Box 70, Towanda, Pa.
 Union Carbide Nuclear Co., 30 E. 42nd St., New York, N. Y.; Bishop, Calif.
 Universal Cycleps Steel Corp., Bridgeville, Pa.
 Vanadium Alloy Steel Co., Latrobe, Pa.
 Vulcan Crucible Steel Co., Aliquippa, Pa.
 Wah Chang Corporation, Woolworth Building, New York 7, N. Y.
 Westinghouse Electric Corp., 1-17 MacArthur Ave., Bloomfield, N. J.

URANIUM ORES

Mills in Operation

Anaconda Company, Bluewater, (Grants) New Mexico
 Climax Uranium Co., Grand Junction, Colo.
 Dawn Mining Co., Ford, Stevens County, Washington
 Gunnison Mining Co., Gunnison, Colo.
 Homestake-New Mexico Partners, Grants, N. Mex.
 Kerr McGee Oil Industries, Inc., Shiprock, N. Mex.
 Lucky Mc, Riverton, Wyoming
 Mines Development, Inc., Edgemont, S. Dak.
 National Lead Co., Monticello, Utah
 Rare Metals Corp. of America, Tuba City, Ariz.
 Texas Zinc Minerals Co., Mexican Hat, Utah
 Union Carbide Nuclear Co., Rifle, Slick Rock, Uravan and Maybell, Colo.; Greenriver and Thompson, Utah
 Uranium Reduction Co., Moab, Utah
 Vanadium Corp. of America, Durango, Colo.
 Vitro Uranium Co., Salt Lake City, Utah
 Western Nuclear Corp., Split Rock, Wyoming

New Mills, planned or under construction

Apex Mining Co., Austin, Nevada
 Freemont Minerals Co., Riverton, Wyoming
 Homestake-Sagin Partners, Grants, N. Mex.
 Kermac Nuclear Fuels Corp., Grants, N. Mex.
 Lakeview Mining Co., Lakeview, Oregon
 Phillips Petroleum, Grants, N. Mex.

ZINC

The American Metal Co., Ltd., 61 Broadway, New York 6, N. Y.
 American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
 American Zinc Co. of Illinois, 1600 Paul Brown Bldg., St. Louis, Mo.
 The Anaconda Co., 25 Broadway, New York 4, N. Y.
 Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 The Athletic Mining and Smelting Co., Ft. Smith, Ark.
 The Bunker Hill Co., Kellogg, Idaho.
 Combined Metals Reduction Co., Felt Bldg., Salt Lake City, Utah.
 E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington 98, Del.
 Eagle-Picher Co., Mining & Smelting Div., Miami, Okla.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 W. R. Grace & Company, Hanover Square, New York, N. Y.
 International Bartering Co., 52 Broadway, New York 4, N. Y.
 International Minerals & Metals Corp., 11 Broadway, New York 4, N. Y.
 Matthiessen & Hegeler Zinc Co., La Salle, Ill.
 Metal Traders, Inc., 67 Wall St., New York, N. Y.
 New Jersey Zinc Co., 160 Front St., New York 7, N. Y.
 Philipp Brothers, Inc., 70 Pine Street, New York 5, N. Y.
 St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
 The Sherwin-Williams Co., Ozark Smelting & Mining Division, 101 Prospect Ave., N.W., Cleveland 1, Ohio.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 U. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

ZIRCON

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
 F. W. Berk & Co., Woodbridge, N. J.
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 Cohart Refractories Co., Louisville, Kentucky.
 Derby & Co., 10 Cedar St., New York 5, N. Y.
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 Electro Metallurgical Div., Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
 Foote Mineral Co., 18 W. Chelton Ave., Philadelphia 44, Pa.
 E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
 International Titanium Corp., 120 Broadway, New York 5, N. Y.
 Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.
 Metal Traders Inc., 67 Wall St., New York 5, N. Y.
 Metallurg, Inc., 100 Park Avenue, New York 17, N. Y.
 National Distillers Corp., Ashtabula, Ohio.
 National Research Corp., Pensacola, Fla.
 Orefraction, Inc., 7505 Meade St., Pittsburgh, Pa.
 Titanium Alloy Mfg., Div. National Lead Co., 111 Broadway, New York 6, N. Y.
 C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
 Woodward & Dickerson, Inc., 1400 Penn Square, Philadelphia, Pa.

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Lead-Zinc Concentrator } Tooele, Utah

Address: Ore Purchasing Department

International Smelting and Refining Co.

818 Kearns Building
Salt Lake City, Utah

Please establish contact prior to shipment

AMERICAN ZINC, LEAD AND SMELTING COMPANY

Buyers of Zinc Concentrates
Suitable for Smelting in Retort
and Electrolytic Smelting
Plants, also Buyers of High
Grade Lead Concentrates.

**Address Communications to Ore Buying
Department**

Paul Brown Building
ST. LOUIS, MISSOURI

423 Mills Bldg.
EL PASO, TEXAS

927 Old National
Bank Building
SPOKANE, WASHINGTON

P.O. BOX 577
DUMAS, TEXAS

MINING WORLD DIRECTORY of Major United States Mining Operations

ABBREVIATION CODE

Accountant	acct
Assistant	asst
Brothers	bros
Chairman	chmn
Chemical	chem
Chief	ch
Company	co
Concentrator	concen
Consolidated	consol
Corporation	corp
Creek	cr
Development	devel
Director	dir
District	dist
Division	div
East	E
Electrical	elec
Engineer	eng
Flotation	flot
Foreman	frm
General manager	gen mgr
Geologist	geol
Gravity	grav
Heavy media	heav-med
Hydraulic	hydraul
Incorporated	inc
Limited	ltd
Manager	mng
Mechanical	mech
Metallurgist	met
Mill(s)	ml
Milling	mlg
Mining	mng
North	N
Operations	oper
Operator	op
Owner	own
Partner	part
President	pres
Production	prod
Purchasing agent	purch agt
Secretary	sec
South	S
Superintendent	supt
Surveyor	surv
Treasurer	treas
Underground	undergr
Vice president	VP
West	W
Yearly	yrly

A CAREFUL SURVEY OF SOME 4,250 MINING and allied processing operations, both active and dormant, was the basis of this list of United States and Alaska mining operations. While MINING WORLD cannot guarantee 100 percent accuracy for this directory, it believes that the list is the best such reference available to the mining industry from any source.

FOR THE GREATEST POSSIBLE UTILITY operations are listed alphabetically by state. Listings are carried under the name of the operating company, owner, mine, or individual operator, according to the wishes of the parties concerned. In cases where properties are commonly known by more than one name, cross references were used where possible. Major companies have more than one listing. Properties and key personnel are listed by states in which the mines are located. There is a cross reference to company executive headquarters and to all other states in which the company operates.

QUESTIONNAIRE FORMS covering major operating details and personnel were mailed over a period of six months. Where information supplied by the operator or owner was not complete, supplementary data was obtained from field reports compiled by staff members, records furnished by the MINING WORLD news bureau, and information from federal and state mining agencies, the United States Atomic Energy Commission, many state geologic departments, state conservation commissions, and state and regional mining associations. Special thanks are extended to the U. S. Bureau of Mines and its regional engineers for help in checking operating properties.

THE PROPERTIES WERE ALL ACTIVE and producing when surveyed, except where "under development" and "idle" have been added. It should be noted especially that many large and important mines are listed in the "idle" class in this directory. This is a temporary situation due to low metal prices. Most of these properties are being kept in good physical repair, water is being pumped from the mines, and they can be placed back in operation within a very short time when management gives the go ahead sign. Totally inactive properties with no indication of future resumption of operations were deleted. Tonnages listed are for daily production, unless otherwise noted. Minerals and metals are listed in order of importance. Key personnel are listed under the address where they may be reached, and unless otherwise specified mill and smelter addresses are the same as those given for the mines.

A SPECIAL NOTE ABOUT URANIUM COMPANIES. Only those uranium companies that are actually operating and/or reportedly made uranium ore shipments in 1957 are listed in this directory. Although MINING WORLD contacted several hundred more uranium companies and hope-to-be uranium companies than are listed on the following pages, only those which gave proof of actually being in the process of production, development, or exploration work were included. Mining companies, mine operators, etc., are listed in the state in which ore was actually mined. Headquarters of the company (producing unit) are then listed and address given even though in another state; which is often the case.

IF YOUR MINE WAS NOT LISTED in this year's directory, fill out the form below, tear it out of the book along the dashed line and mail it to MINING WORLD, 500 Howard Street, San Francisco 5, California, and your name will be added to the list receiving questionnaires for next year's directory section.

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ATTENTION: New Mine Operators Unlisted Mine Operators

LIST YOUR MINE IN THE 1958 MINING YEARBOOK MINE DIRECTORY SECTION

To receive questionnaire for listing your mine complete and mail this form to:

Your Name

Your Address

Your City State

Editor, MINING WORLD
500 Howard Street
San Francisco 5, California

Mining Company

ALASKA

AGOFF, HARRY

c/o Prince Cr Mng Co, Flat
PLACER Prince Cr, Iditarod dist,
nonfloat, Au

ALASKA METALS MNG CO

Box 965, Fairbanks
STEPOVICH & GOLBERT
PROPERTIES
LODE MINES, Gilmore Dome, Fair-
banks dist, WOG
Under devel

ALASKA NICKEL CO

c/o Fred Jenkins, Eagle
LODE MINE, Plume Cr, Eagle dist,
Au
Under devel

ALASKA PACIFIC CONS MNG CO

519 Colman Bldg, Seattle 4, Wash
Pres: V & Montgomery
VP & Gen Mgr: W M Stoll
Sec: Carl W Eismann
INDEPENDENCE MINE, 25 N of
Wasilla, undergr
Idle
160-TON FLOT - AMAL MILL
Idle

ALDER CREEK MNG CO

Box 1099, Fairbanks
Part: Martin Sather, Jr.
PLACER 34 mi N of Fairbanks, Au

ALLUVIAL GOLDS, INC

Coal Creek
Pres & Gen Mgr: Ernest N Patty
Dir: Walter Seligman, E D Bull,
Mrs. A D McRae
PLACER on Woodchopper Cr, Circle
dist, Yukon riv region, 4 ft dredge,
Au
To operate in 1958

ATLAS MINES

Box 109, Nome
Pres, Owner & Gen Mgr:
Geo Waldheim
PLACER & OPEN PIT MINE, 100
mi N of Nome, Kougarak dist,
Seward Penin reg, dragline-doser-
hydraulic, Au
Prod: 500 yds daily
MILL, Kougarak

BARTHOLOMAE, WM A

P O Box 248, Brea, Calif
Pres & Gen Mgr: W A Bartholomae
GOLD PLACER MINE, Gold Run Cr
Port Clarence
GOLD MINE, Ester Dome, via
Fairbanks
Eng: B W Vallat
Idle

BITTNER, PAUL

Central
PLACER Deadwood Cr, Circle dist,
hydraulic, Au, Ag

BLISS & SONS

Ungalik
PLACER, Bonanza Cr, hydraulic-
doser, Au

BRINKER - JOHNSON CO

141 Battery St
San Francisco, Calif
Pres: W W Johnson
VP: T Keith Johnson
PLACER on Caribou Cr, via
Fairbanks 4 1/2-ft dredge, Au, Ag
Idle
(Owned by Walter W Johnson Co
Dollar Bldg, San Francisco, Calif)

CANYON CREEK MNG CO

Alaska
Gen Mgr: Jens A Kvamme
PLACER on Canyon Cr, Aniak dist,
Kuskokwim R reg, doser-sluice
plate-hydraulic, Au

CARLSON, IVAR C

Ophir
MINE, Little Cr, Innoko dist,
nonfloat

CARSTENS, HEINE, C &

DELTA
Alaska Co, Central
PLACER, Portage Cr, Circle dist, Au

CHANDALAR MNG CO

819 3rd Ave, Anchorage
Op: Hugh Matheson, Jr.
PLACER, Big Cr, Chandalar dist,
nonfloat, Au

CHATHAM CREEK MNG CO

Box 64, Fairbanks
Berg, Twitten & Wickstrom
PLACER, Chatham Cr, Fairbanks
dist, Yukon R reg, dragline-doser,
Au

COLLINSVILLE MINES,

A PARTNERSHIP
1557 H St, Anchorage
GOLD PLACER, 1,500-yd dragline
& nonfloat wash pl, 100 air mi NW
of Anchorage
Frm: Carl Durand
Idle

COLORADO CREEK MNG CO

McGrath
Part: John E & Richard S
Fullerton
PLACER, 60 mi N of McGrath on
Colorado Cr, Au, Ag
Prod: 2,000 cu yds

CROWN POINT MINES

Box 1417, Seward
Gen Mgr: Anson E Gouldsbury
CROWN POINT MINES, undergr, Au
MILL, Mile 25, Seward
Idle

DAHL CREEK MINE

709 - 5th Ave, Fairbanks
Op: C E Stout
PLACER, Dahl Cr, Shungnak dist, Au

DE COURSEY MT MINING CO

Red Devil
Pres: Ray Wolfe
VP: Robert Lyman
Sec-Treas: H R Heard
RED DEVIL MINE, Red Devil, undergr
Hg
Gen Mgr: R S Velikanje
Asst Gen Mgr: Warren Rice
Geol: Leo F Fay
DE COURSEY MINE, 30 mi N of
Crooked Cr, Kuskokwim River, Hg
Idle
RED TOP MINE, Marsh Mt, Alekna-
gik, Hg
Mine Supt: Frank James
Under devel

DONLIN PLACERS

Crooked Creek
Own: Robert F Lyman
PLACER in Snow Gulch 10 mi N of
Crooked Cr, Aniak dist, Kuskokwim
Riv pfg, doser, Au
Idle

EDGEUMBE EXPLORATION CO

218 S Hudson, Pasadena 5, Calif or
Box 756, Sitka
Pres: C T Morgan
VP: C A Haley
Treas-Gen Mgr: G H Morgan
Sec: A Holden
EECO MINE, Silver Bay, Undergr,
Au, Ag
Idle
EECO GRAY MILL at Silver Bay
(See Calif)

FERN GOLD MNG CO

502 Columbia Bldg, Spokane, Wash
Pres: J L Drumheller
VP: Martin Woldson
Sec: L R Gordon
FERN MINE, Palmer, undergr, Au
Idle

FRANKLIN MNG CO

Tok Junction
Part: Howard Bayless, Dick Roberts,
Bob Roberts & Ellis Roberts
PLACERS at Franklin & Chicken,
hydraulic, dragline, doser, Au

FRASCA & CO

Box 1882, Fairbanks
PLACER on Eagle Cr, Circle dist,
hydraulic-doser
(Leased from Berry Holding Co)

FREMONT MNG CO

400 Torrey Bldg, Duluth 2, Minn
Man Part: Warren S Moore
Ch Geol: John P McKee
Exploration
(See Minn)

GOLD PLACERS, INC

Coal Creek
Pres & Gen Mgr: E N Fatty
VP: Walter Seligman
Dir: E B Bull & Mrs A D McRae
PLACER, Circle dist, Au, 4 ft dredge

GOLD STREAM MNG CO

Box 218, Fairbanks
Pres: D G Bread
VP: Emil Usibelli
Sec: Charles Clashy
PLACER, Goldstream Cr, near Fox,
Nonfloat, Au
Mine Frm: Henry Falke

GRANITE CREEK MNG CO

Ruby
Pres: Wm Carlo
VP: Wm Carlo, Jr
Sec: P Carlo
PLACER on Ophir Cr, 50 mi S of
Ruby, Yukon reg, hydraulic-doser,
Au

GRANT CREEK MNG CO

Tanana, P O 53
Part: Lars Indegard, Frank C Edging-
ton
PLACER, Grant Cr, approx 25 mi
W of Tanana, Au
Prod: 1,000 to 1,200 cu yds

GOODNEWS BAY MNG CO INC

422 White Bldg, Seattle 1, Wash
Pres: Andrew O Olson
VP & Gen Mgr: Edward Olson
Sec: G D Connor
Treas: C J Johnston
GOODNEWS BAY PLACER, Platinum
Gen Mgr: Edward Olson
Asst Gen Mgr: John W Weeks

HARD, ERIC

Ophir
BEAR CR PLACER, Folger, Au
Mine Supt: Eric Hard

HASSEL MNG CO

Box 1071, Fair
PLACER, Ready Bullion Cr, Fair-
banks dist, Au

HAVENSTRIE OIL CO

MNG DIV
Candle
PLACER Candle Cr, Fairhaven
dist, nonfloat, Au

HEINER, LARRY

LODE PROSPECTS, PLACER,
Petersburg & Kupreanof dists, Au
Idle

HERBERT SYNDICATE

Box 1108, Fairbanks
Mgr: Charles F Herbert
Exploration

HOLMES, WALTER L

May Creek via Cordova
REX CREEK MINE, Nisina dist,
placer, open pit, hydraulic, Au
Under devel

HUNTER CREEK MNG CO

c/o Melo Jachowich, Rampart
PLACER on Hunter Cr, Rampart
dist, hydraulic-doser, Au

HYDER MINES, INC

904 4th Ave, Seattle 4, Wash
Pres: Donald H McNelly
VP: Edward R Wheat
Sec-Treas-Purch Agt: J W Boothe
RIVERSIDE & CANTU MT MINES,
Hyder, undergr, pb, ag, WOG, Au,
Cu, Zn
Mine Supt: Henry L Hill & Assoc
Under devel
100-TON FLOT MILL, at Riversids
mine
Idle

I L & M MNG CO

Box 2015, Ketchikan
Pres: Lee Hollenbeak
VP: Irma Hollenbeak
Sec: Charles W Miller
I L & M MINE, Kendrick Bay,
Ketchikan dist, U3O8
Under devel

INMACHUK MNG CO

Box 272, Nome
Own: Grant H Nelson
PLACER, Deering, Au
Idle

KENAI CHROME CO

545 E 4th St, Anchorage
Part: John G Bachner
Part & Gen Mgr: Mike E Seltzer
STAR NO 4 MINE, Red Mt, Homer
Cr, undergr, Cr2O3
Asst Gen Mgr: Karl A Bachner
Mine Frm: Norman Crooks
Prod: 100 long tons
50-TON ROD MILL, at mine
Mill Supt: Mike E Seltzer

KENDRICK BAY MNG CO

Miners Park, Golden, Colo
Pres: Frank Coolbaugh
VP: John J Curson
Sec: John P Fitts-Gibson
Treas: Thomas E Congdon
KENDRICK BAY MINE, Prince of
Wales Island, Alaska, open pit, U3O8
Devel Mgr: W Ernest Jones
Field Supt: Harold Wright
Mine Eng: Gary Bannister
(See Colo)

KODIAK EXPLORATION CO, INC

Box 448, Kodiak
Pres: George H Cornelius
VP: Emil Knudsen
Treas: Robert von Scheele
Purch Agt: Ralph Johnson
Field Dir: Henry Neseth
KECO PINK ROCK MINE, Kodiak,
undergr, WOG, Cu, Au
Gen Mgr: Henry Neseth
Asst Gen Mgr: Tom von Scheele
Geol: Charles H Scott
Mech Eng: Walter Achen
CLAIMS, undergr, open pit, placer,
U3O8, WOG, Au, Cu, Ni, Co, Ag
KOUGAROK FREIGHT & MNG CO
Box 137, Nome
Part: E C Straub & E Tomner
PLACER, 11 mi NE of Nome, Au,
dredge
Prod: 30,000 yds yearly

LAST CHANCE MNG CO

Box 639, Nome
Op: William S Munz
PLACER, Bluff, Au, bucket-line
floating dredge

LAZO URANIUM ASSOC

Box 883, Ketchikan
MINE, 3 Arm Molra Sound,
Ketchikan dist, U3O8, Th
Idle

LEE BROS DREDG CO

Seismon
Gen Mgr: Richard Lee
PLACER on Solomon Riv, Seward
Penin, bucket Au, Ag
Eng: Allan W Lee
Prod: 7,500 yds

LITTLE MINOOK MNG CO

Fairbanks
Pres & Gen Mgr: Albin Martin
PLACER on Little Minook Cr,
Rampart dist, dragline-hydraulic-
doser, Au, Ag
Prod: 600 yds

LONG CREEK MNG CO

Ruby
Gen Mgr: Hans Tilleson
PLACER at Long Cr, Hydraulic-
doser-dragline, Au, Ag

LOST CHICKEN HILL MINES INC

2438 N Shore St, Chicago 45, Ill
c/o George Turner
PLACER, Lost Chicken Cr,
Fortymile dist, Au

LUCKY EIGHT MNG CO

Eagle
Oper: Burnett F Hansen, Borghild
Hansen
PLACER, Crooked Cr, Au

LUCKY NELL MINE

Hollis
Own: J J Matuska
MINE, 7 mi W of Hollis, undergr,
Au, Ag, Pb, Cu
Under devel
PUYALLUP MINE, 1 1/2 mi W of
Hollis, undergr, Au, Ag
Under devel
CASCADE MINE, 3 mi SW of Hollis,
undergr, Au, Ag
Under devel

LUCKY SEVEN MINE

Miller House
Op: Walter Roman
PLACER, Matadon Cr, Circle dist,
doser-hydraulic, Au

LYNCH CREEK MINE

P O Box 53, Tanana
Part: Lars Indegard,
Frank Cogdington
PLACER, tributary of Grant Creek,
stripping
Under devel

MACLAREN RIVER COPPER
Box 4001, College
KATHLEEN-MARGARET COPPER
MINE, College, undergr, Cu, Au, Ag
Under devel

MANSKE, DAN
Chicken
PLACER, Ingle Cr, Fortymile
dist, Au

Mc COMB, ROBERT
Chicken
MINE, S Fort Fortymile Riv,
Fortymile dist

MINERALS RESEARCH
3 Marine Way, Juneau
Exploration only

MISCOVICH BROTHERS
Poorman, Flat
Part: George Miscovich,
John A Miscovich,
Howard Miscovich,
Andrew Miscovich
PLACER, Poorman, Au
PLACER, Flat, Au
Prod: 300,000 to 500,000 cu yds yrlly

NATIVE BISMUTH, INC
Box 267, Nome
Pres & Gen Mgr: O A Margraf
VP: D M Russell
CHARLEY CREEK BISMUTH MINE,
35 mi N of Nome, undergr, Bi,
Bi₂S₃, Au
Idle

NEW YORK - ALASKA GOLD
DREDGING CORP
1616 Smith Tower, Seattle, Wash
Pres & Man Dir: J K Crowley
VP: G C C King
VP: Mark Mathewson
Sec: Leise G Robbins
Treas: Fannie Barley
Purch Agt: L E Robbins
NEW YORK - ALASKA MINE, 60
mi NE of Bethel, placer, 3 dredges,
dragline, Au
Res Mgr: Wm H Race
Asst Mgr: M F Bailey
Elec Eng: Clarence Clark

NEWMONT MINING CORP OF
CANADA LTD
604-744 West Hastings St, Van-
couver, B.C., Canada
Pres: John Dryburgh
VP: P Malosomoff
Sec: A W Burt
Treas: J L MacKidd
Exploration

NORTH AMERICAN DREDGE
CO

Flat
Own: Alex Mathieson
PLACER, Flat, Iditarod dist,
2,500 yd bucketline, dredge, Au

NORTHERN LIGHTS MNG CO
Ruby

Gen Mgr & Mech Eng: Michael Carroll
PLACER, Ruby dist, Au

NOVATHEY, ROBT A
104 West 5th St, Juneau
Sec-Treas: Dorothy H Novatney
MILLER LEDGE & LODGE, Helm Bay,
open pit, Au, Ag
Under devel

OLIVE CREEK MINES
Box 552, Fairbanks
Own-op: Carl Parber
PLACER on Olive Cr, 80 mi NW
of Fairbanks, dragline-doser, Au, Ag
Prod: 900 cu yds

P R & H MINING CO
Miller House
Part: P D Parker, J W Raymond,
P O Hopkins
MASTADON CR PLACER, 118 mi
N of Fairbanks, Au, Ag
Prod: 1,000 yds

PEKOVICH, W S
Box 2642, Juneau
MINE, Port Snettisham, Juneau dist,
Fe
Under devel

PILGRIM, EARL R & CO
Box 1890, Fairbanks
Own & Gen Mgr: Earl R Pilgrim
STAMPEDE MINE, Stampede, 110
mi SW of Fairbanks, undergr, Sb
40-TON GRAY MILL
Idle

PITTS, E H
Big Lake
PITTS PLACERS, Big Lake,
hydraulic, Au, Ag

PRINCE CREEK MNG CO
Flat
Own: Harry Agoff
PLACER on Prince Cr, Iditarod
dist, Yukon Riv reg, hydraulic, Au
Idle

PRINCE MNG CO
216 Front St, Ketchikan
PROSPECT, SE Alaska, UG₀₈
Idle

PRITCHETT, HEATH &
TUCKER
2401 3rd Ave, Ketchikan
MINE, SE Alaska, UG₀₈
Under devel

PROSPECTORS, INC
544 2nd Ave, Fairbanks

PURDY, FRED & ARTHUR
Chicken
PLACER on Myers Fork, 40 mi
dist, Yukon Riv reg, dozer-
hydraulic, Au

PURKEYPILE, I W
Box 572, Fairbanks
PLACER on Tozimoran Cr, 30 mi W
of Tanana, Sn, Au
Under devel

QUEBEC METALL IND, LTD
c/o J Ronkowski, Box 40, Haines
PLACER & LODGE, near Klukwan,
Juneau dist, Fe
Under devel

RAINBOW MNG CO
Nome
Pres: Frank H Whaley
VP: Frank B Whaley
PLACER, 90 mi N of Nome, open
pit, Au

ROSANDER & REED
Ophir
Pres: T Rosander
PLACER, Yankee Cr, Innok dist,
hydraulic-doser-dragline, Au

SAVAGE, PAT
Ruby
PLACER, Long Cr

SCHAEFER, RUSSEL R
Crooked Creek
CINNABAR CR PLACER, Kuskokwim
Riv, undergr, Hg
Prod: 10 tons daily
10-TON MILL, at mine

SCHWAESDALL, ANDY
Fairbanks
PLACER on Myrtle Cr, Koyukuk dist,
Yukon Riv reg, Au
Idle

SELDOVIA CHROME CO INC
Seldovia
Pres: John Little
VP: Dallas Newell
Sec: Frank Ruby
MINE, Seldovia, open pit, Cr
Under devel

SLATE CREEK MNG CO
Box 1564, Fairbanks
PLACER, Slate Cr, Koyukuk dist,
Au, Ag

SLATE CREEK PLACERS
408 7th St, Hamilton Acres,
Fairbanks
Own: Hilliard Annet
PLACERS, Slate Cr, Rampart, Au
Idle

SOUTH FORK MINING CO
Chicken
Own: R S McCombe
Sec: Muriel McCombe
PLACER, dozer-pump, Au

SOUTHEASTERN MNG &
EXPLORATION CO, INC
c/o Faulmer, Bandfield and
Brochewitz, Juneau
Pres & Gen Mgr: Howard C Hayes
VP: Ray Mansfield
Sec: Joe Smith
Treas: Gordon Kanouse
LUCKY SIX MINE, Box 1136, Douglas,
Undergr, UG₀₈, Rare earths
Under devel

SQUAW CREEK MNG CO
Fairbanks
Op: Edwin C Gelvin
PLACER, Squaw Cr, Circle dist, Au

STANICH BROS
Fairbanks
PLACER, Porcupine Cr, Koyukuk
dist, Au

STRANDBERG MINES, INC
926 4th Ave, Anchorage
PLACER, Colorado Cr, Innok dist;
Indian Riv, Hughes dist; Eureka Cr,
Hot Springs dist, Au
LODE PROSPECT, Yentna dist, Au
NIXON FORK MINE, McGrath dist

THUNDER MINES, INC
Anchorage
PROSPECT, Thunder Cr, Yentna dist,
Au
Idle

TIGER TALISMAN PLACER
Box 284, Nome
Gen Mgr: J H Alexander
250-yd hydraulic-doser, Au, Ag

TIMBERLINE PLACERS
c/o Spade & Stout, Miller House
PLACER, Porcupine Cr, Circle dist,
Au
Idle

U S SMELTING, REFINING &
MNG CO
Box 1170, Fairbanks
VP & Gen Mgr, Alaskan Opr: J D
Crawford
FAIRBANKS DEPT., 7 gold dredges in
Fairbanks area
Mgr: J C Boswell
Mine Supt: T A Loftus
Dredge Supt: W A La Fon
Cashier: L E Linck
Prod: 6,000,000 cu yds gravel
HOGATZA OPERATIONS, 1 gold
dredge
Supt: Ralph B. Norris
Prod: 800,000 yds gravel
NOME DEPT., 3 gold dredges
Mgr: C S Glavinovich
Supt: W A Glavinovich
Cashier: Robert Baldwin
Prod: 3,000,000 cu yds gravel
(See Ariz, Mass, N Mex, Utah)

U S STEEL CORP
525 William Penn Pl, Pittsburgh 30,
Pa
EXPLOR, SE Alaska
(See Ala, Calif, Minn, Pa, Tenn, Utah,
Wyo)

UOTILA & HARD
Ophir
Gen Mgr: Gus Uotila
OPHIR CR PLACER, Au

WACKWITZ, FRED
Box 1595, Fairbanks
PLACER, Bedrock Cr, Fairbanks
dist, shovel-in, Au
LODE, head of Cleary Cr, Pb

WESTERN ALASKA MNG CO
Box 121, Spenard
Op: R J Anderson
MINE, Russian Mins, Aniak dist, Hg

WILKINSON, ROBERT W
Miller House
PLACER, Miller Cr, Circle dist, Au

WOLF CREEK MNG CO
Box 141, Fairbanks
Pres: Andrew Anderson
VP: Geo Outomson
Gen Mgr: M Olson
PLACER, 26 mi N of Fairbanks,
stripping over, Au

ZAISER, CLARENCE
Ruby
PLACER on Greenstone Cr, drift, Au

ALABAMA

ALABAMA FLAKE GRAPHITE
CO
320 Comer Bldg, Birmingham
Pres & Gen Mgr: W L Shumate, Jr
VP: W L Moore, S P McDonald
Sec-Treas: J F Berry Baugh
FOCAHONTAS MINE, 4 1/2 mi W of
Ashland, Ala, open pit, Crucible
graphite, mica
Asst Gen Mgr: Joseph Sims

Gen Supt: W L Moore
Geol: H L Williams
Met: L B Adams
Under devel
300-TON FLOT MILL
Idle

AMERICAN TALC CO
Chatsworth, Ga
Pres: M Woodward Glenn
VP: Francis T Glenn
Sec: J R Ferry
MINE, WINTERBORO, open pit, talc
Mine Supt: N R Davis
Prod: 100 tons
50-TON GRAY MILL, Alpine
Mill Supt: T E Davis
(See Ga)

ARRINGTON MNG CO
Cedartown, Ga
WASH PLANT, Glenwood, Brundidge,
Pike County, Fe

B & S MNG CO
Greenville
WASH PLANT, Butler County

BIBB MNG CO
Brundidge
WASH PLANT, near Brundidge

DIXIE MINES, INC
Box 365, Heflin
Pres & Treas: Ernest Kretschmar
VP & Purch Agt: Joe W Bailey
Sec: Robert Abbott
Adm Asst to Mgr: Eldridge Loudermilk
SHEFFNER MINE, Micaville, open
pit, mica
Gen Mgr: Joe W Bailey
Geol: E C Van Horn
Mine Frm: Glenn Gibson
MILL, wash, screen, tabling
Mill Frm: Almond Hughes

GLENWOOD MNG CO, INC
Glenwood
Pres & Gen Mgr: I D Gibson
VP & Asst Gen Mgr: C B Gibson
Sec-Treas: D F Jackson, Sr.
GLENWOOD MINES, open pit, Fe
Gen Supt: H A Patton
Mech Eng: M G Cornett
Prod: 1,000 tons
MILL
Mill Supt: W D McLeod
Asst Mill Supt: H H Patten

GREENVILLE MNG CO
Greenville
WASH PLANT, Butler County

REPUBLIC STEEL CORP
Birmingham
EDWARDS MINE, Birmingham,
undergr, Fe
Mgr: B H McCrackin
Supt: B C Jones
Elec Engr: J Donohue
Ch Engr: R B Watt
Maint Engr: E Read
Prod: 600,000 tons per yr
SPAULDING MINE, Birmingham,
undergr, Fe
Supt: J G Blackwell
Frm: P E Roy
Eng: George Jones
Prod: 1,000 tons
GRAV CONC
Prod: 400,000 tons per year
GRAV CONC
Prod: 250,000 tons per year
BLAST FURNACE, E Thomas, Ala
BLAST FURN & STEEL PLANT
Gadsden
So Dist Mgr: C Barrett
(See Mich, Minn, NY, Ohio)

SHOOK & FLETCHER SUPPLY
CO
1814 1st Ave N, Birmingham
Pres: P G Shook
VP: A M Shook, III
Sec-Cont: H O Thomas, Jr.
Purch Eng: L M Quick
BLACKBURN & WARNER MINES,
Russellville, surface, Fe
Gen Mgr: E H Craddock
ADKINS MINE, Woodstock, surface,
Fe
Gen Mgr: H C Gunter
Prod: 2,500 tons

U S PIPE & FOUNDRY CO
3300 1st Ave N, Birmingham
Pres: C S Lawson
VP: Fred Osborne
Sec: J W Brennan
Treas: W S Wilson
Purch Agt: H E Cross
Gen Supt: J W Nicol
Geol: Jack E Morris

Mog Eng: Geo Jones
Met: R H Spacey
Elec Eng: L E Shiffman
Safe Eng: J A Downey
RUSSELLVILLE MINE, 7 mi SE Russellville, surface, Fe
Supt: S A Britton
Frm: Hobart Norton, H McAllister
Prod: 100 tons
HEAVY MEDIA MILL
Prod: 1,200 tons of limonite per day
BLAST FURNACE, Birmingham
Gen Supt: Dan Watkins
RUFFNER #3 MINE, Irontide, 7 mi E of Birmingham, undergr, Fe
Idle
SLOSS #2, Bessemer, 12 mi W of Birmingham, undergr, Fe
Supt: J W Russell
Asst Supt: P M Snow

U S STEEL CORP **TENNESSEE COAL & IRON DIVISION**

P O Box 599, Fairfield
Pres: A V Wiebel
Exec VP: J W Kinnear, Jr
VP-Oper: W E Crouch, Jr
Mgr: Raw Mat: E P Reed
Ch Engr: Raw Mat: W S Springer
Purch Agt: L C Teague
IRON ORE MINES & COND PLANT, 4 undergr mines near Bessemer
Cap: 4,650,000 net tons crude iron ore per year
Gen Supt: A W Beck, Jr
Supt: #7 and 8 Mines: P J Zukow
Supts: #3, 10, 11 & 14 Mines:
R W McElroy
Supt: Ore Cond Plant: G M Neal
(See Alaska, Calif, Minn, Pa, Tenn, Utah, Wyo)

WILSON, D M, BAUXITE CO **Eufaula**

WILSON, R E, MNG CO
Eufaula
MINE, bauxite
Prod: 80 tons
80-TON MILL, Eufaula
Supt: Paul Taylor

WOODWARD IRON CO

Woodward
Pres: John E Urganhart
VP: W R Bond
Soc: D T Turnbull
Gen Supt: John Hager
Met: F U Leonard
Safe Eng: Stanley Mooney
Purch Agt: H K Stokes
PYNE MINE, 8 mi S of Bessemer, undergr, iron ore
Mine Supt: T W Davis
Asst Mine Supt: W H Thompson
Mine Engr: S E Sullivan
BLAST FURNACE, Woodward
Supt: J B Casey
Asst Supt: C Y Huff
Prod: 772,932 net tons per year

ARIZONA

JAMES D AKINS CO
1126 Petroleum Bldg, 14 # Olympic, Los Angeles 15, Calif.
CONFUSION # MINE, Yuma County, Mn

AKKEN MINES

2207 N 24th St, Phoenix
Pres: J A Akren
Gen Mgr: Fred Jenkins
PIONEER MINE, 30 mi E of Florence, undergr & surface Au, Ag, Cu, Th
Under devel
GLENOWAN MINES, Hg, pitchblende
Under devel

ALBA MNG CORP

Readers
CHETO MINE, Apache Cty, surface, bentonite
Mgr: Spencer Balcomb, Jr

ALKEY MINE

Tombstone
Own: E B Escapula
Pb, Ag
Mgr: Jeff Humphrys
Idle

ALTA URANIUM INC
10th & Grand, Grand Junction, Colo
Pres: R E Derwart

VP: Tom Casto
Soc: O O Taylor
Treas: G R Simpson
GUANO CARRS MINE, San Simon, Uto
Mine Supt: Wm Nelson

ALTUDA MINES, INC

P O Box 1743, Yuma
Pres: James V Spagon
Gen Mgr: Harry E Hamilton
VP & Asst Gen Mgr: Doyle C Gilla
ALTUDA MINE, 25 mi SE of Gila Bend, undergr, Au, Ag
Idle

ARAPAHOE MNG & URANIUM CORP

Jefferson
Pres: Dr Ralph M Strub
VP & Gen Mgr: C J Gillaspay
MALACHITE COPPER MINE, Jefferson County, open pit, Cu, Au, Ag, Si
Idle

AMBROSIA MINERALS, INC

783 First Nat'l Bank Bldg, Phoenix
Pres: John V Persons
VP: Neil A Rice
Sec-Treas: H W Haynes
PURPLE PANSY MINE, Agula, open pit, Mn
Gen Supt: Ted Wyatt
Idle
GRAV & HEAVY MEDIA MILL, Agula
(See N Mex)

AMERICAN COPPER & URANIUM CORP

Globe
FOUR BAGGER MINE, Gila Cty, surface & undergr, Cu, Ag, Uto
Mgr: L O Goodwin
Idle

AMERICAN FIBER CORP

(SUBSID OF HOLLY MINERALS CORP)
Drawer 2980, Globe
Pres: A H McRae
VP: J C Heaston
Soc: F E Melancon
Treas: H Anderson
Purch Agt: H E Town
ROCK HOUSE, CLARINE, & CHRYSLER TILE MINES, Gila County, undergr, asbestos
Gen Mgr: Harry Anderson
Geol: J Thiel Sullivan
Surveyor: Don F Simons
Mine Supt: Paul Norris
Mine Frm: J Perez, W Jenkins
Prod: 45 tons
MILL, Rock House mine, crushing & screening
Mill Supt: G B Gullledge
Frm: M Reeves
Prod: 100 tons
MILL, Chryssotile mine
Frm: W Jenkins
Prod: 100 tons

AMERICAN SMELTING & REFINING CO

WESTERN MNG DEPT SW DIV
813 Valley Nat'l Bldg, Tucson
Mgr: T A Snodden
Asst Mgr: A C Hall
Ch Geol: Kenyon E Richard
HAYDEN PLANT, Hayden, 1900-ton smelt and conv, Cu
Supt: P J Downey
SW ORE PURCH OFFICE
810 Valley Nat'l Bldg, Tucson
Mgr: Reed F Welch
SILVER BELL MINE, Silver Bell, surface, Cu
Gen Supt: D R Purvis
Prod: 7,500 tons
MILL, Silver Bell, flot
(See Calif, Colo, Idaho, Ill, Kans, Mont, Nebr, N J, N Mex, N Y, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

AMERICAN URANIUM CORP

817 Sixth St, S W, Albuquerque, N Mex
SCHOOL BOY & ASA CODY MINES, Navajo Indian Reservation, surface, Uto, V
Gen Mgr: E T Chase
Gen Supt: Wm J Elam
Geol: Dale H Carlson
Asst Mine Supt: Ass Cody
Mine Eng: E T Chase

AMERICAN ZINC, LEAD & SMELTING CO

1515 Paul Brown Bldg, St Louis, Mo
HILLTOP MINE, Portal, undergr, Pb, Zn, Ag, Cu
Idle
(See Ill, Mo, Okla, Tenn, Tex, Wash)

AMPET CORP

Colorado Bldg, Denver, Colo
Pres: R A Gus Davis
Sec-Treas: Alfred O Brehmer
MINE, Apache County, Uto
(Leased to K S Mitty)
(See Colo, Utah)

ANCHA ASBESTOS CO

Box 1593, Globe
REYNOLDS FALL ASBESTOS MINE, Uto
Idle

APACHE MINING CO

P O Box 384, St Johns
Uto Prod

ARI - MICH MINES, INC

Box 701, Prescott
Pres & Gen Mgr: C W Gabrielson, Sr
VP: Harold Gates
Soc: Lynwood Webb
Gen Supt: C W Gabrielson, Jr
CATOCTIN MINE, 12 mi SW of Prescott, undergr, Ag, Au, Pb, Zn, Cu
Idle

ARIVACA MNG CO

1820 E Hampton St, Tucson
Own: C N Vogel
VOGEL MINE, Pima County, Pb, Zn
AMADO MINE, Pb, Ag, Au
Idle

ARIZONA ASBESTOS MNG CO

c/o A H Dress, Box 923, Globe
STANSBURG MINE, asbestos
Idle

ARIZONA CONTINENTAL URANIUM, INC

Astec Lodge, Young Rd, Globe
Pres: Willard Oldwits
Soc: M H Braun
Treas: E E Young
HOPE MINE, Young Rd, Globe, undergr, Uto
Gen Mgr: Gerald Weathers
Mine Supt: F M McConchie
Under devel

ARIZONA COPPER MINES INC

Graha
Pres: J E Moewinkle
Gen Mgr: W R Shanklin
MINES, 20 mi N of Tucson, Cu
Supt: Louis Stickrad
Idle

ARIZONA GOLCONDA METALS

Kingman
PEACH TUNNEL, Mohave County, undergr & surface, Pb, Zn
Mgr: Pat Dall
Under devel

ARIZONA GYPSUM CORP

P O Box 6182, 2255 S 19th Ave, Phoenix
Pres: John F Fisher
VP, Gen Mgr, Mine Supt: James W Champlin, Sr
Soc, Purch Agt: William J Kessler
Treas: John M Maselet
ARIZONA TYPSON MINE, P O Box 54, Winkelman, open pit, gypsum
MILL, crush & screen

ARIZONA MINE, THE

Box 87, Humbolt
Gen Mgr: Verdin Alexander
ARIZONA MINE, THE, 2 1/2 mi W of Humbolt, Au, Ag, Pb, Zn
Idle

ARIZONA MINES CONSOL

Box 125, Casa Grande
STELLA MARIS #1, Pinal County, surface, Mn
Frm: Donald Wenger
(Leased from Don Deblivia)

ARIZONA MNG CO

Box 2618, Tucson
VENTANA MINE, Pima County, Mn

ARIZONA MNG & DEVEL CO

Payson
RATTLESNAKE MINE, Gila Cty, undergr & surface, Hg
Mgr: A B Griffith
Idle

ARIZONA MOHAVE MNG CO

401 W Van Buren St, Phoenix
Pres: Earl H Duke
VP: James E Creighton
Sec: R E Korte, Jr
MEXICAN MINE, Box 388, Kingman, undergr, Ag, Cu, Au
Gen Mgr & Mine Supt: Stanley W Duke

Asst Mine Supt: Francis A Lampou
Mine Eng: Reed E Roberts
Under devel

ARIZONA WAX PAPER CO

MINES & EXPLORATION DIV
Box 2228, Phoenix
19 MINE, Box L, Winkelman, Pb, Cu, Zn, Au, Ag
Gen Supt: Norman C Grisoom
Under devel
50-TON GRAV-FLOT MILL, at mine

ARROWHEAD URANIUM CO

1005 K 5th St, Grand Junction, Colo
Uto Prod

ASH PEAK LEASE

Box 208, Duncan
COMMERCE & SHAMROCK MINES, Ag
Idle

ATHLETIC MNG CO

Box 792, Safford
Pres: Raymond F Orr
VP & Gen Mgr: Harvie L Newton
Soc: Ander L Orr
HEAD CENTER MINE, 12 mi NW of Alondyke, undergr, Zn, Pb, Cu, Ag, Au
Mine Supt: James Bryce
Mine Eng: A B Insworth
Idle
PANAMA MINE, Zn, Pb, Ag
Mine Eng: A M Bosworth
Idle
150-TON FLOT MILL, Alondyke
Mill Supt: Florian Burcan
Assay: Ervin Kuglerdall
Idle

AZTEC MINING & DEVEL CO

7151 S Missiondale Rd, Tucson
Op: Harold Stevens & Phil Stevens
KEYSTONE MINE, Cochise Cty, Cu
Under devel

B & E MNG CO

Box 42, Tumacacori
Pres, Gen Mgr, Mine Eng: D D Burchar
VP: George Eis, Jr
BULL SPRINGS MINE, Josephine Canyon dist, undergr, Pb, Ag, Au, Cu
Mine Supt: F O Otero
Prod: 50 tons

B S & K MNG CO

Suite 702 1st Nat'l Bank Bldg, 411 N Central Ave, Phoenix
Pres & Gen Mgr: A M Kalaf
VP: George Kalaf
Sec-Treas: Lee Newsum
ATLAS MINE, Box 18, Silverbell, 19 mi SW of Red Rock, undergr, Cu, Zn
Geol: A M Hugg, Jr
Mine Frm: Walter Whitlow
125-TON FLOT MILL, 19 mi SW of Red Rock
Mill Frm: Milton Reeves

BAGDAD COPPER CORP

Bagdad
Pres: J C Lincoln
VP: Frank Smith
Soc: R H Jamison
Treas: Gen Mgr: G W Colville
Purch Agt: J W Schultze
Controller: M Thon
BAGDAD MINE, Bagdad, surface, Cu, Mo, Ag
Asst Gen Mgr: R C Hogart
Mech Eng: C R Hamman
Geol: O Campbell
Met: E S Howell
Elect Eng: W D Deacon
Safety Eng: B J Henderson
Chf Eng & Mine Supt: E LeRoy Jones
Mine Frm: D S Pike, Van Irwin
Prod: 5,000 tons
3,500-TON COPPER FLOT MILL, Bagdad
Supt: Gaylen Guest
Frm: A T Weatherhead, B P Mullins, D Van Tilborg
Assay: D T Holmes

BALCONES CORP

403 E Travis St, San Antonio, Texas
DOG TOWN MINE, Pima County, undergr surface, Pb, Ag
Mgr: Geo Edwards
Under devel
(Leased from Fred W Plakam, 60 N Church St, Tucson)

BALESTROS, RICHARD

AP
SAN ANTONIO MINE, Pima County, SIO2

BAKKER, MRS LUCILLE
Peoples Valley
CHRISTMAS HOLIDAY MINE, Au, Ag

BANNER MNG CO
2042 Conner Stravenue, Tucson
Pres: E S Bowman
VP: L L Travis, John M Wallace
Sec-Treas: James E Hogle
Purch Agt: E C Bowman
DAISY & MINERAL HILL MINES,
Tucson, undergr, Cu, Ag
Gen Mine Supt: B W Venable
Chf Acct & Asst Sec: F C Prince
Mine Supt: Wm Anderson, Jr
Mine Fm: Gus Holzworth
Mine Surv: Alton Young
Geol: F D MacKenzie
Met: Paris Brough
Plant Mech: E E Bray
Plant Eng: G E Jackson
Chem: R G Miranda
Chf Elct: H Rodgers
TWIN BUTTES MINE, Tucson
Idle
1,000-TON FLOT MILL, Mineral
Hill mine
Supt: Frank Horton
(See N Mex)

BEAR CREEK MNG CO
719 E Copper, Tucson
Mgr: Ray Robinson
LOVE STAR MINE, 10 mi NE of
Safford, undergr
Under devel

BECCHETTI COPPER CORP
2525 E Osborn Rd, Phoenix
Pres: Anton D Becchetti
VP: Arthur Rando
Sec: William Radzick
Treas: George Hansmann
Purch Agt: Felix Falus
CLIFF & SILVER PLATE MINE,
Box 503, Cottonwood, undergr, Cu,
Au, Ag, Th
Gen Mgr: Felix Falus
Asst Gen Mgr: Bill Schrambling
Geol: Harold Ferrin
Mine Supt: Ignacio Picon
Asst Mine Supt: Jesus Rodriguez
Mine Fm: Gilbert Langdon
Mine Eng: Bob Burne
Prod: 50 tons
FLOT MILL, Cottonwood

BEE - SHO - SHEE MNG CO
c/o George Newitt, Fruita, Colo
BEE-SHO-SHEE MINE, Apache City,
undergr, surface, U₃O₈, V
Mgr: George Newitt

BEN HUR MNG CO
Klondyke Rural Station, Wilcox
BEN HUR MINE, Graham County, Pb,
Zn
Idle

BIG HOLE MNG CO
c/o Albert Adams, Box 125,
Jerome
UNITED VERDE MINE, Yavapai,
open pit, Cu

BIG HORN MNG CO
155 Montgomery St., San Francisco,
Calif.
Pres: Daniel Pickrell
BLACK ROCK MINE, Maricopa Cty.,
open pit, Mn
Prod: 200 tons

BIG SIX CO
Box 645, Eloy
Pres: Jim Brookbank
VP: Bill Stanfield
Sec: M Rozales
Treas: V A Cordell
Purch Agt: W A Kauffman
Q U MINE, Globe
Idle

BIG SIX EXPLORATION, INC
Young
Mgr: R J Allison
BOGER ASHFORD MINE, Gila Cty.,
U₃O₈
CITATION MINE, Gila Cty., U₃O₈
Idle

BLACK CANYON COPPER CO
INC
Box 1531, Phoenix
Pres: J W England, Jr
VP: Jerome Kaye
Sec-Treas: Ben Silverman
KAY COPPER MINE, Rockspring,
undergr, shaft, Cu, Zn, Au, Ag
Idle

BLACK DIAMOND
Yuma City
BLACK DIAMOND, Yuma Cty
Surface & undergr Mn
Supt: Floyd Brown

BLACK DRAGON
c/o W S Tolcott, Tucson
BLACK DRAGON MINE, Pima Cty.
surface, Mn
Mgr: W S Tolcott
Idle

BLUEBONNET URANIUM
CORP
Box 2366, Globe
Pres: Karl Gras
VP: Douglas Risinger
Treas: Ernest Garrett
COPPER CHIEF MINE, Stanley
Butte, 50 mi E of Globe, undergr
Cu, Ag, Au, Ba
Gen Mgr & Mine Supt: Wm W Sorenson
Under devel

BLUE JESTER MINES, INC
519 S Grand, Tempe
BLACK JACK MINE, Pima Cty.,
undergr, Mn
Gen Mgr: Russell Wright
Frm Owen Wade
Prod: 20 tons

BLUE ROCK MNG CO
1913 W Georgia St., Phoenix
BLUE ROCK MINE, Yuma Cty.,
Ag, Cu

BOSDIKE, WILLIAM
Cave Creek
WARD CLAIMS, Maricopa Cty., Mg

BOSLEY MNG CO
312 W Dale, Flagstaff
Pres: Howard V Bosley
COPPER MT MINE, 15 mi W of
Payson on E Verde Riv, undergr &
open pit, Cu, Ag
Gen Mgr: Howard V Bosley
Gen Supt: R L Barry
Geol: A S Walters
Under devel

BOYD & FORTNER
P O Box 1891, Wickenburg
Part: Bert Boyd & B H Fortner
LUCKY MICA #1 MINE, 11 mi S of
Wickenburg, undergr & open pit,
epidomene, lepidolite, amblygonite
Be, Ch, Ta, Bi
Idle

BRACKEN R J & F
Agua
CROW MINE, Maricopa Cty., undergr,
Mn
Mgr: R J Bracken
Idle

BRADLEY & ECKSTROM, INC
24 California St., San Francisco 14,
Calif.
MINES, variety of minerals
(See Calif., Idaho)

BRASHEAR MNG CO
Morrison
MIDNIGHT OWL MINE, Maricopa
Cty., surface, Li, columbitum,
berite
Mgr: P C Brashear

BUCKEYE MARJ-ANN MNG CO
Oper: Sam Wallick, Box 1824,
Goodyear & Ralph Richard,
6109 E Exeter, Scottsdale
BUCKEYE APACHE MINE, Chinohee
Cty., Au, Ag
MILL, at mine
Under devel

BUCKEYE MICA CO
Box 418, Buckeye
Pres & Gen Mgr: H G Smith, Jr
VP: H G Smith, Jr
Sec: W Peaback
BUCKEYE GROUP, 3 1/2 mi S of
Buckeye, under gr, Mica/Muscovite,
sericite, Be, Feldspar
Supt: A Duncan
Asst Supt: C Murphy
Frm: C V Hill
Prod: 100 tons
LUCKY CHANCE 1-2-3, 5 mi W of
Quartzsite, Sericite
Prod: 25 tons
Under devel
100-TON DRY & WET GRINDING
MILL
Supt: J G Smith, Jr
Frm: Wayne Watts

BUELL, AL
Wickenburg
DESERT ROSE MINE, Maricopa Cty.,
Mn

BULL CANYON TUNGSTEN
MINE
Box 43, Yucca
Idle

BUNDY, C M
Mt. Trumbull
RED WING MINE, open pit, U₃O₈
Under devel

BURNEY MINES, INC
Box 5116, Tucson
Pres & Gen Mgr: R A Burney
VP: B H Martin
Sec-Treas: Lilla Burney
STOVE LID & AMPITHEATER
MINES, 6 mi S of Oracle, undergr,
Pb, Zn, Cu, Ag
Idle
50-TON FLOT MILL, at Copper
Rose claim
Idle

BY CHANCE MINE
c/o Col Frank Childs, Ajo
Op: Von H Calloway
MINE, Pima Cty., Ag, Cu
Idle

CALARI MNG CO
3939 Linden, Long Beach 7, Calif
Pres & Gen Mgr: L F Albrecht
Sec-Treas: C M Smith
RUTH MINE, Box 941, Prescott, 6 mi
S of Prescott, undergr, Zn, Pb, Cu,
Ag, Au
Under devel

CAMPBELL, GEO W & SON
Box 701, Salome
BLUE EAGLE CLAIMS, W₃
Idle

CAMPBELL, J A
Box 1145, Wickenburg
BIG SPAR, WEST END, JUMBO
MINES, Florence
Under devel

CAPITOL-SEABOARD CORP
Box 1847, Farmington, N Mex
Pres: Joseph H Corbin
Exec VP & Gen Mgr: Chas W Yetter
Sec: Wm A Pope, Jr
Treas: Howard L Corbin
SIMPSON #1 MINE, Apache Cty.,
undergr, U₃O₈, V₂O₅
Prod: 15 tons
(See Idaho, Mont, N Mex, Tex, Utah)

WM J CAREY MNG CO
824 Road Ave, Grand Junction,
Colo
MINE, Navajo Indian Reservation,
Navajo Cty
Explor
(See Colo)

CARLOTA COPPER CO
530 W Latham, Phoenix
Pres & Gen Mgr: John L Alexander
CARLOTA MINE, 15 mi W of Miami,
surface, Cu
Under devel

CHARLESTON MINES, INC
Box 357, Tombstone
Pres & Gen Mgr: Chas H Sulter
CHARLESTON LEAD MINE, 7 mi SW
of Tombstone, open pit, sericite,
Au, Pb, Cu
Prod: 40
WASHING PLANT, at mine

CAT CLAW MNG CO
Miami
Mgr: E H Kellum
CAT CLAW MINE, Gila Cty., Cu,
Ag, Au

CHESSER & CO
Window Rock
URANIUM EXPLOR, Navajo Indian
Reservation

CHILITO MINE GROUP
Box 1065, Hayden
Own: B C Velasco
MINE, Gila Cty., Cu

CHRISTOFFERSON, HANS
Box 80, Agua
MINE, undergr, Mn

CIDOLA MNG CO
Phoenix
J F JR MINE, Yuma Cty., Mn

CINDERRA MNG & ENGINEER-
ING CO
200 Main St., Dallas, Texas
CINDERRA MILL, W₃
Mgr: M F McKnight, Box 36, Sells

CLANI, THOMAS
Teec Nos Pos Tradingpost,
Shiprock, New Mex
U₃O₈ Prod

CLIMAX URANIUM CO
Box 1901, Grand Junction, Colo
VP & Gen Mgr: A M Mastrovich
URANIUM EXPLOR & PROD,
Navajo Indian Reservation
(See Colo, NV, Utah)

COBRE GRANDE MNG CO
P O Box 253, Safford
COBRE GRANDE MINE, Aravaipa
Mng dist, Graham Cty., undergr,
open pit, Cu, Au, Ag
Gen Mgr & Geol: Tom Beard
Asst Gen Mgr: Sam Neville
Gen Supt: Dan Hinton

CONNER-SPLICER MINE
c/o F Fisher, 1390 Casa Vista St,
Pomona, Calif
MINE, Yuma Cty., Pb, Ag

COLBURN, E A JR
Box 152, Congress
CONGRESS MINE, 3 mi N of
Congress Jt, undergr Au, Ag, W₃O₈,
U₃O₈
Under devel
(Lensed to Jaquays Mng Co, Phoenix)

CONAM MNG CORP
Box 4038, Alexandria, Va
Eng: R O Bellsmith, 4803 E Justin
Lane, Tucson
MINE, 50 mi NE of Tombstone,
undergr, Ag, Pb
Under devel

CONSOL TUNGSTEN MINES,
INC
Bagdad
Mgr: J M Cobb
MINE in Yavapai Cty., W₃
Idle

B W COPELAND MINES
311 S Montezuma St, Prescott
Own: B W Copeland
C & A MICA & FAIRY TALE MINES,
West Yavapai Cty., Cu, Ag, Au
Under devel

COPPER CITIES DIVISION,
MIAMI COPPER CO
61 Broadway, New York 6, NY
Pres: E H Westlake
VP: J H Ffolliott
Sec: Henry Kaufman
Treas: John G Greenburgh
Purch Agt: R L Beale
COPPER CITIES DIVISION, Box 100,
Miami
VP & Gen Mgr: B R Coit
Asst Gen Mgr: John H Gray
Gen Supt: C C Webb
Geol: W W Simons
Mech Eng: J J Luchessa
Met: J J Beas
Elec Eng: T J Williams
MINE, 3 mi N of Miami, open pit,
Cu
Mine Supt: M M Stever
12,000-TON FLOT MILL, Miami
Supt: T D Henderson
Conc Supt: R L Mountjoy
Assayer: G W Warren
(See NY)

COPPER BUTTE MNG CO
Box 668, Ray
COPPER BUTTE MINE, 7 mi W of
Ray, surface, Cu
Mgr: C F Mitchell
Mech Eng: Filmore Neikilla
Idle

COPPER CREEK COPPER CO
505 Title & Trust Bldg, Phoenix
OLD RELIABLE MINE, Pinal Cty.,
Cu
Idle

COPPER CREEK MINES, INC.
Box 415, Maricopa
CHILDS-OLDWINKLE MINE, Pinal
Cty., Cu
Supt: R A Burney
Under devel

COPPER HILL MNG CO

Box 991, Globe
Pres: T R Black, Box 46
Tipp City, Ohio
VP: T R Black, Jr.
Purch Agt: L O Goodwill
SUPERIOR & BOSTON MINES, 4 mi
NE of Globe, undergr, Mn, Cu
Idle

COPPER HILL SILICA

Globe
COPPER HILL SILICA MT, Gila
Cty, surface, Cu, Si
Mgt: E M Moores

CORONADO COPPER & ZINC CO

1308 Pacific Mutual Bldg,
Los Angeles 14, Calif
Pres: George D Dub
VP: Henry T Mudd
Sec: C W Six
Purch Agt: W F Stover
JOHNSON CAMP MINE, Box 44,
Dragoon, 3 mi NW of Dragoon
Mine Mgr: Fred E Gray
Geol: R E Bergman
Idle
MOORE & REPUBLIC MINES,
6 mi N of Dragoon, Undergr, Cu, Zn
Idle
200-TON FLOT MILL, Johnson
Camp
Idle
(See Calif)

CORONADO MINES, INC

RED MT, BUENA VISTA, GOLDEN
ROSE & WASHINGTON MINES,
Box 558, Nogales, undergr, Cu,
Mo, WO₃, Pb, Au, Ag, pyrite

CORONATION MNG CO, INC

Box 387, Bouse
Pres & Gen Mgr: Charles Milton
VP: L A Linebaugh
Sec-Treas: H S Schneider
CORONATION MINES #1-74, Au,
Ag, Cu &
Idle

CRIPPLE CREEK MNG & MLO CO

Box 247, Cripple Creek
URANIUM EXPLOR, Navajo Indian
Reservation
Under devel
(See Colo)

CROWN ASBESTOS MINES, INC

Box 1443, Globe
Pres: J E Talbot
VP & Gen Mgr: Fred W Kreider
Sec: Harry Oltmore
Geol: Arthur R Still
MINE, 55 mi NE of Globe, undergr,
stripping, asbestos (chrysotile soft)
Supt: Fred W Kreider
Idle

CYPRUS MINES CORP

523 W 6th St, Los Angeles 14,
Calif
OLD DICK MINE, Box 548, Bagdad,
undergr, Zn, Cu
Gen Mgr: Paul W Allen
Res Mgr: Curtis Sundeen
Mine Supt: D P Turberville
Geol: Keith Cole
Mech Eng: Herbert Dahimon
Cnf Ck: W Nelson
Mine Eng: Robert Bonnis
Prod: 200 tons
Under devel
200-TON FLOT MILL, Bagdad
Mill Supt: L Vundt
Assay: H Bollweg
(See Calif, Colo)

DASCO MINES CORP

Box 87, Wenden
Pres: Murphy D Wallace
VP: Alfred T Morgan
Sec: Harrison Doyle
Treas: Charles Mull, Jr
DOYLE MINE, 25 mi N of Wenden,
open pit, Mn
Mine Supt: Neil D Mecce
200-TON FLOT MILL, Wenden
Mill Supt: Harold Barr
Assay: Gilbert L Frayer

DE LA OSSA, ALEX

Patagonia
KANSAS MINE, Pima Cty, surface,
undergr, Cu, Pb, Zn

DE SILVA, DON

515 E Willetta St, Phoenix
STELLA MARIS #1 MINE, Pinal
Cty, surface, Mn
(Leased to Aris Mines Consol)

DIAMOND URANIUM CORP

330 Ness Bldg, Salt Lake City, Utah
U₃O₈ Prod

DIXIE QUEEN MNG CO

Phoenix
Mgr: John Phillips
DIXIE MINE, Yavapai Cty, Be, Mica

DRAGON ZINC MINE

Ow: Flora C Hubbard, 1201 St
Mary's Rd, Tucson & Mrs W G
Swart, 1713 High St, Alameda,
Calif
MINE, Cochise Cty, Zn
Idle
(Leased to C B Higgins, Box 156,
Benson)

DRAKE MNG CO

Black Canyon
KAY COPPER MINE, Yavapai,
surface, undergr, Cu
Mgr: Kenneth Clark
Idle

DUNCAN, WALTER MNG CO

Box 1488, Cortez, Colo
Pres: J Walter Duncan, Jr
Gen Mgr: Charles R Butler
CISCO MINE, LaSachukai Mts, Apache
Cty, 53 mi SW of Shiprock, N Mex,
undergr, U, V
Idle

DUTCH FLAT GROUP

Yucca
Own: Birt J Jackson
MINE, Mohave Cty, undergr, WO₃,
Au, Pb, Ag
Idle

DUVAL SULPHUR & POTASH CO

17th Flr, Melille Esperson Bldg,
Houston 2, Texas
Pres: W P Morris
VP: G E Atwood
VP & Treas: Eugene German
Sec: V J Thornhill
COPPER DIVISION-ESPERANZA
MINE, Box 1877, Tucson 2,
open pit, Cu, Mo
Res Mgr: G E Atwood
Asst Res Mgr: B G Messer
Geol: D M Clippinger
Metal: C H Curtis
Mine Eng: Tom Jancic
Mech Supt: H A London
Under devel
10,000-TON FLOT MILL, at mine
Mill Supt: I B Phillips
(See Texas)

DYE & BATHRICK - A PARTNERSHIP

Box 1069, Kingman
Gen Mgr: R L Dye
Asst Gen Mgr: J H Bathrick
BORIANA MINE, Yucca, 18 mi NE
of Yucca, dumps, WO₃, Cu, Ag
Idle
FLOT-MILL, at mine
Frm: C C Strouse
Idle

COPPER WORLD MINE, Yucca, Ag, Zn, Cu, Pb

Under devel
(Leased to Mt States Mng Co)

EL JAKARTA MNG CO LTD

Box 42, Tumacacori
Pres, Own & Gen Mgr: D D Burcher
A-B MINE, Josephine Canyon,
undergr, Cu, Pb, Au, Ag
Geol: E R Hill
Mine Supt: F O Otero
Mine Eng: D D Burcher
Under devel

EL PEQUITO MNG CO

P O Box 812, Apple Valley, Calif
U₃O₈ Prod

EMERALD ISLE MINES

Box 174, Chloride
Op: C G Patterson
MINE, Chloride, Cu
Idle

EMPEROR - DUCHESS MINES CO, INC

Fairfield, Idaho
Pres: Ben Laswell
VP: Chas Fuller
Sec-Treas: Roland Baldwin
Dir: Laurence Green, Sells
MINE at Sells, Cu, Ag
Supt: M Green
Idle

EVANS, B

Agulla
LIONS DEN & WISCONSIN MINES,
Maricopa Cty, Mn

EVANS & EVANS

Agulla
NEEDLE EYE MINE, Mohave Cty,
surface, Mn
Mgr: F T Evans
Under devel

EVERETT & RICHARDSON

Duncan
EUREKA #3 MINE, fluorapar
Idle

FOSTER, L H

Box 814, Duncan
EUREKA MINE, Greelee Cty,
fluorapar
Idle

FOUTZ & THOMAS

Box 318, Apache City
MITTEN & MONUMENT #1 MINE,
Apache Cty, surface, undergr, U₃O₈
Mgr: J T Fraka

GAR PAC, INC

112 N Central, Phoenix
Pres: Pace Foster
VP & Asst Gen Mgr: Garlin Davis
Sec: Ray Burgi
Treas: Pat Foley
Idle
(See N Mex)

GEN DEVEL & MNG CO

530 N 42nd St, Phoenix
Pres: Herman D Rhea
VP: Walter A Weisback
Sec: Frank H Lauerman
HOME STRIKE MINE, Nogales,
undergr, Au, Ag, Pb, Cu
Under devel
MORNING GOLD MINE, Patagonia
Under devel
100-TON MILL, Patagonia
Mill Supt: Simon S Schnarsky
Asst Mill Supt: Willis V Rhea
Idle

GENERAL MNG CORP

8273 Sunset Blvd, Los Angeles,
Calif
Pres: E J Speake
VP: Don Carly
Sec: Allan Thody
Treas: Howard Mallring
MINE, Yuma Cty, undergr, Mn
Prod: 35 tons
(See Calif)

GIACOMA BROS

Box 546, Tombstone
Mgr: A P Giacomia
COSTELLO GROUP, AN
DEPTANCE MINE, Cochise Cty,
undergr, surface, Pb, Zn

GIBALTAR MINERALS

Kayenta
Mgr: Ralph Payne
BOOT JACK MINE, Navajo Cty,
U₃O₈

GIBALTAR URANIUM & OIL CO

Box 352, Grand Junction, Colo
Pres: I W Andrews, Jr
ROUGH ROCK #1, Navajo Reservation,
Chinle, undergr, U₃O₈, V
Gen Mgr: James I Geddes
Geol: Joe Bowman
Supt: James Martin
Prod: 30 tons

GIL TED MNG CO

Agulla
Mgr: V D Standley
MINE in Maricopa Cty, Mn

GILBERT, D C

Patagonia
ESTELLA MINE, Santa Cruz Cty,
surface, undergr, Cu, Pb, Zn

C O GLASSCOCK-TIDELANDS OIL CO

1801 Wilson Tower, Corpus Christi,
Texas
BIG BANANA MINE, Box 38, Sells,
undergr & open pit, WO₃
Mgr: M F McKnight
Geol: Gene Deadman
50-TON GRAY MILL, Pima Cty

GLOBE - TOLEDO MNG CO

528 Spitzer Bldg, Toledo, Ohio
GLOBE-TOLEDO MINE, Gila Cty,
Cu
Idle

GLOBE URANIUM, INC

Globe
SUE MINE, Gila Cty, surface,
undergr, U₃O₈
Mgr: W W Sorson
Idle

GODFREY & GODFREY

San Manuel
Oper: Raymond Godfrey, Grand
Godfrey
BLACK BEAUTY MINE, Pinal Cty,
Mn
Under devel

GOLCONDA CORP

Chloride
Mgr: Pat Paterson
GOLCONDA MINE, Mohave Cty,
Zn, Au, Ag, Pb

GOLD BASIN PLACERS

c/o Joe Jackson, Box 9,
Quartzsite
PLACERS, Yuma Cty, Au

GOLDEN CROWN MNG CO (MERGED WITH WESTERN GOLD & URANIUM INC, SEE THAT CO)

GOLDEN RULE MINE

Dragoon
Co-Own: M V Lee
MINE, undergr, Au, Ag, Pb

GOLDFIELD MINES, INC

Mesa
Own: Hugh Nichols
Mgr: T R Russell
GOLDFIELD MINE, NE of Mesa,
surface, Au
Idle
125-TON CYANIDE MILL
(Leased to Heber & Landis)

GRAY FOX TUNGSTEN

c/o E A Mitchell, Congress
Idle

GREEN STREAK MINE

Own: R L Fleming, Bouse
Op: L A Applington
MINE, Yuma Cty, Au, Ag, Cu
Idle

GUNSITE BUTTE URANIUM CORP

26 W Broadway, Salt Lake City,
Utah
Pres: Milton V Backman
VP: Claude Lacy
Sec: M J Florence
Treas: Nick Vrontakis
THOMAS #1, Marble Canyon, undergr,
U₃O₈
Gen Mgr: L J Pyne
Eng: Ralph Karlsten
Idle

H & H MINING CO

Yucca
Gen Mgr: Earl Heath
MARY NEVADA MINE, undergr, Ag,
Pb, Au
Frm: Sheldon Heath
Idle
40-YD GRAY OPR
Supt: Ray Farr

W B HALL

Cortez, Colorado
U₃O₈ Prod

HANSFORD, LARRY

Quartzsite
BOWYER GAP MINE, Yuma Cty,
surface, undergr, U₃O₈
Mgr: L L Farrington
Idle

HAPPY JEAN GROUP

Bouse
Op: George Bernardie
MINE, Yuma Cty, Au, Ag, Cu
Idle

HARRAUGH & CHINN

Box A, Tuba City
Gen Part: Kenneth H Harbaugh
Part: Howard A Chinn
JACKPOT #1-5-40, Cameron area,
open pit, U₃O₈
Gen Supt: John Kleiner
Prod: 5 tons

HEATHER, HARRY F

236 S Oak Knoll Ave, Pasadena,
Calif
SPEC-BOMA MINE, Oatman, Au
Under devel
(See Calif)

HENDERSON, MRS A S

Box 27, Patagonia
MINERAL MINE, 12 mi N of
Patagonia, undergr, Pb, Zn, Ag,
Cu
Idle
(Leased to R G Moreno)
STAR #1, 2 7 3 MINES, 12 mi N of
Patagonia, surface, Mn
Idle

HERALD MNG CORP

921 Simma Bldg, Albuquerque,
N Mex
PURPLE PANSY, Maricopa Cty,
open pit, Mn
Idle

HILTON, E P

Box 1308, Tucson
STATE OF MAINE & LONE MTN
MINES, undergr, Pb, Ag, Au
Idle

HOLLY MINERALS CORP

(See SUBSID AMERICAN FIBER CORP)

HOLMESTAKE MNG CO

Box 308, Winterhaven, Calif
SONORA GROUP, Yuma Cty, Pb, Ag
Idle
(See Calif)

HOLY CROSS MINE

1302 Casa Grande Rd, Tucson
MINE, Pinal Cty, Ag, Cu
Idle

HOOPES & CO

Globe
Mgr: K L Hoopes
MINE, MILL, in Gila Cty, Limestone

HOWARD MNG CO

Bouse
JACKY #1 & 2 MINES, Yuma Cty, Cu
Idle

HOYT, PHILIP S & SON

P O Box 2040, 543 E Culver,
Phoenix
Own: Philip S Hoyt, Sr &
Philip S Hoyt, Jr
MICA MINES, Mohave, Maricopa,
Yuma Cty, undergr & surface,
mica, rare earths
Under devel

HUNTLEY INDUSTRIAL MIN, INC

Box 305, Bishop, Calif
Treas: L G Hummel
MERLO MICA MINE, Kingman
Idle
(See Calif)

INDUSTRIAL URANIUM CO

Phoenix
Mgr: Bill Doolin
NATIONAL MINE, Maricopa Cty, Hg
SUNLIGHT & STARLIGHT MINES,
Navajo Cty, U₃O₈

INSPIRATION CONS COPPER CO

25 Broadway, New York 4, N Y
Pres: P D Honeyman
VP & Sec: H M Jacob
Treas & Asst Sec: E F Wendt
Dir of Purch: A B Harris
INSPIRATION MINE, Inspiration,
surface, Cu
Asst Gen Mgr: H C Weed
Asst Sec & Asst Treas: C G Stuns
Plant Supt: C B Kettering
Geol: E F Reed
Mech Eng: A H Neal
Met: P M Musgrove
Elec Eng: Mark Smith
Auditor: E M Bredwell
Purch Agt: E F Dolin
Power Pl Supt: T E Tisard
Mine Supt: J R Waite
Asst Mine Supt: T E Bileon
Open Pit Frnt: T M Anderson
Ch Mng Eng: J L Carne
Prod: 16,000 tons
CHRISTMAS MINE, Christmas,
undergr, Cu
Gen Supt: B B Whitney
Mine Supt: N G Thomson
Mine Frnt: M R Flaks
Geol: J T Eastlick
Under devel
LEACHING PLANT AND CONC,
Inspiration
Plant Frnt: W D Schrader
Acid Plant Frnt: W H Parker
Conc Supt: K L Power
Conc Frnt: A L Welch

INTERNATIONAL MINERALS & CHEM CORP

CONS FELDSPAR DEPT, 20 N Wacker
Dr, Chicago 6, Ill
VP: Norman J Dunbeck
Gen Mgr: James E Castle
Mgr: E W Koenig
Asst Mgr: Phil Blaskovic, Jr
Sales Mgr: W K Burris
FELDSPAR MINE, Box 229,
Kingman, surface
Supt: J W Allen
150-TON MILL, E KINGMAN, fine

grinding

Supt: J W Allen
(See Colo, Fla, Ill, Maine, Miss,
N.C., Okla, S.D., Tenn, Va)

INTERNATL ORE CORP

Wickenburg
MINE, Maricopa Cty, surface, Hg
Mgr: D P Simpson
Idle

INTERNATIONAL RANWICK LTD

2810-25 King St W, Toronto,
Ontario, Canada
Pres: J D Bateman
VP: J M Eason
Sec: A C Callow
Treas: J T McWhirter
COPPER BASIN MINE, Prescott
Idle

INTERNATL SMELTING & REFINING CO

Miami
3,000-TON CUSTOM SMELTER,
Inspiration
Supt: Harold Foard
Ore Buyer: Clifton F Smith

INTERSTATE MNG & EXPLOR CORP

1036 1st Nat'l Bank Bldg, Denver 2,
Colo
Pres: S R Mahoney
VP & Treas: L H Seagrave
Sec: W G Dillon
VP: B C Heath
PROSPECT MINE, underfr, U₃O₈
Gen Mgr: G C Ridland
Under devel
(See Colo)

INTERSTATE OIL & DEVEL CO

P O Box 1325, Wickenburg
U₃O₈ Prod

IRON GAP URANIUM CORP

Tempe
IRON GAP MINE, Gila Cty, surface,
U₃O₈, Cu
Mgr: B H Martin
Idle

ISBELL CONST CO

Box 1710, Phoenix
ESPERANZA COPPER MINE, Tucson,
contract mng for Deval Sulphur &
Potash Co
Supt: John Wright
MINE, Cameron, U₃O₈, contract mng
for Rare Metals Corp
Supt: Jim Shehan
(See Idaho, Nev, Utah, Wash)

JAMES STEWART CONST CO

Box 347, Tombstone
Supt: Chas H suiter
CHARLESTON MINE, Cochise Cty,
Pb, Zn
Under devel
MILL, at mine

JAQUAYS MNG CORP

1219 S 19th Ave, Phoenix
Pres & Gen Mgr: D W Jaquays
VP: G A Jaquays
Sec-Treas: Ethelyn Jaquays
Asst Gen Mgr: Alvin Gerhardt
Gen Supt: Leroy Wood
REGAL & ASBESTOS KING MINES,
Box 328, Globe, 47 mi N of Globe,
undergr, asbestos
Mine Supt: P H Padgett
Prod: 50 tons
15-TON GRAV MILL, Globe
Mill Supt: W Meyers
CONGRESS MINE, 3 mi N of Congress
Jl, undergr, Au, Ag, WO₃, U₃O₈
Under devel
(Leased from E A Colburn, Jr)

JOHNSON MNG CO

55 N Matlock St, Mesa
Mgr: A H Johnson
RARE METALS MOLY MINE &
BLACK COPPER GROUP, 4 mi S of
Kelvin, undergr, Cu, Au, Ag, Mo,
U₃O₈
Idle

K B R MNG & DEVEL CORP, INC

Box 186, Yarnell
Pres & Purch Agt: Jerold P Kolar
VP: Claude Brittain
Sec: P A Brittain
Treas: Elsie Kolar
STAR OF ARIZONA, ELSIE'S JACK
POT #1 & #2 MINES, Kolar Group,
undergr, Au, Ag, Cu, Pb
Gen Mgr: C A Brittain
Idle

KACHINA URANIUM CORP

307 W McDowell Rd, Phoenix
Pres & Gen Mgr: Carl C Adair
VP: A T Laprade, Jr
Sec: V W Adair
JEESTER #1, KACHINA #6 &
MONTEZUMA #1 MINES, Cameron,
open pit, U₃O₈
Geol & Mine Supt: Page Blakemore
Prod: 15-20 tons

KADAB URANIUM CO INC

908 Odd Fellow Bldg, Indianapolis,
Ind
U₃O₈ Prod

KENNECOTT COPPER CORP,

RAY MINES DIV
Ray
Gen Mgr: A P Morris
Asst Gen Mgr: H J O'Carroll
Compt: C R Knox
Purch Agt: N E Guyer
Adm Asst: C L Hoyt
Safety Eng: R A Willoughby
Ind Eng: A T Shukas
RAY MINES, open pit, Cu, Ag
Gen Mine Supt: J C Van DeWater
Geol: J Werts
Asst Pit Supt: R W Ballmer
Ind Rel Dir: J E Peterson
Asst Mech Supt: A L Dickerson
Pit Frnt: W Taylor
Ch Eng: H W Bishop
Ch Elect: L J Miller
Prod: 16,000 tons
16,000 - TON FLOT MILL, Hayden,
23 mi SE of Ray
Supt: J L Stevens
Asst Supt: G P Sewell
Master Mech: P M Hoskins
Met Eng: D V Balbiati
Plant Eng: R C Johnson
Ch Elect: C C Fanning
SMELTER, Hayden
Project Mgr: Frank Woodruff
Under const
(See Nev, N Mex, NV, Utah)

KENNEDY McGEE MNG CO

Shiprock, New Mexico
U₃O₈ Prod

KENT MINES, INC

c/o Jim Kent, Box 87,
Yarnell
BLACK DIKE MINE, Au, Pb, Ag, Mo

KERR - McGEE OIL INDUST, INC

NAVAJO URANIUM DIV
Box 608, Shiprock, New Mex
DOVE MINE, Cove, undergr,
U₃O₈, V₂O₅
Gen Mgr: M F Bolton
Geol: Billy Stevens
Mine Supt: Jack London
Mine Frnt: Vernon Willdan
Prod: 150 tons
MILL, Shiprock, N Mex
500-TON MILL, Shiprock
Supt: Dick Shreve
(See Colo, New Mex, Okla, Wyo)

JIMMIE KING

c/o T E Scanlon & Assoc, P O Box
601, Farmington, N Mex
U₃O₈ Prod

KINSEY, T C

Mammoth
CRESCENT MINE, Pinal Cty,
surface, Mn
Mgr: Frank Parker
Idle

KNOX - ARIZONA COPPER

MNG CORP
8967 Lachie Rd, St Louis 24, Mo
Pres: Wm A Knox
VP: Tom Keyes
Sec-Treas: Wm A Knox
COPPER MT MINE, Ajo
Geol: Edward Clark
Under devel

KYLE ASBESTOS MINES

OF ARIZ
Box 392, Globe
SLOAN CREEK, LUCKSTRIKE MINES
Op: Roger Q Kyle

LA GOLONDRINA MINE

Dragoon, open pit, Cu, Pb, U₃O₈,
V₂O₅, Mo
Own: M V Lee
Idle

LEAD KING MINES, INC

701 S 9th St, Las Vegas, Nevada
Pres & Gen Mgr: Eugene G Moyns
VP: Frank LaGrange
Sec: William B Byrne

RUTH & RATTAN MINES, San
Francisco Mng dist, Mohave Cty,
undergr, Au
Idle

LEAD & ZINC CORP OF AMER

Box 406, Globe
Pres: Grady B Gulledege
VP: J B Williamson
Gen Mgr: Ray Pointer
BEN HUR MINE, 15 mi NW of Kion-
dyke, undergr, Pb, Zn, Cu, Ag
Idle

LEON, MILTON

208 Wright Bldg, Tulsa 3, Okla
UNCLE SAM MINE, Box 659,
Nogales, 5 mi NE of Nogales,
undergr, Au, Ag, Pb
Under devel

LEROY MINE

Cochise Cty
MINE, Cochise Cty, undergr &
surface, Pb, Ag
Mgr: Gwido Bloome, Manhattan
Beach, Calif
Idle

LEWISOHN COPPER CORP

128 N Church, Tucson
Pres & Treas: Richard E Chilson
VP: Boyd M Morse
PEACH MINE, Helvetia, 35 mi SE
of Tucson in Santa Rita Mts, open pit,
Cu
Idle

KING MINE, Helvetia, undergr, Cu

LIEBERMAN ENTERPRISES, INC

1500 W Avo Way, Tucson
Own: Donald K Lieberman
125-TON GRAV FLOT MILL
Idle

LIND, C L

Chloride, Box 10
COUSIN JACK COPPER, TYLER,
LADY BUG, EVANOM MINES &
CLAIMS
Under devel

LUCKY MNG CO

Box 1842, Parker
LUCKY MINE, Yuma Cty, Cu
Idle

LUCKY STOP MNG CO

Young Rt, Globe
Partnership: Johnnie Brunson
William Brunson
Ed Conway
Hugh Nichols
LUCKY STOP MINE, Gila Cty,
undergr, U₃O₈
Mgr & Mine Supt: Johnnie Brunson
Idle

LUCKY SWEDS MNG CLAIM

Box 2231, Warren
Own: George Erickson
CLAIM, 6 mi E of Lowell, undergr,
Idle

M & M MNG CO

Pampa, Texas
U₃O₈ Prod

M & S COPPER CO

Box J, Casa Grande
REWARD MINE, Pinal Cty, Pb, Zn
Idle

PETER C MAC KERVIE

c/o Gen Delivery, Apache Jt
U₃O₈ Prod

MAGIC MINE

Wenden
As
Op: E J Johnson, T E Warren
Idle

MAGMA COPPER CO

Box 37, Superior
Pres & Gen Mgr: W P Goes
Asst: P O Sarver
Asst Gen Mgr: J F Buchanan
VP & Sec: Roy Bonebrake
Treas: W P Schmid
Purch Agt: Ray Medlock
Aud: P S Franklin
MAGMA MINE, Superior, undergr,
Cu, Ag, Au
Gen Mgr: Darrell Gardner
Asst Gen Mgr: J F Buchanan
Gen Supt: G L Augustadt
Geol: R N Webster
Mech Eng: Howard Johnston
Elec Eng: T P Traak
Frnt: Cecil Tomerlin
Eng: B Van Voorhis
Prod: 1,500 tons

1,500-TON PLOT MILL, Superior
Supt: Halder Rex
Frm: M C Cookley
Assay: Martin Harris
REVERB SMELTER, Superior
Supt: E J Caldwell
Asst Supt: C L Steele
Prod: 48,000,000 lbs per year

MAGMA KING MANGANESE MINE
Superior
MINE in Pinal Cty, Mn, Ag
Mgr: Ralph Pomeroy
Idle

MANGANESE KING MNG SYN
Box 335, Bouse
Pres: R N Doyle
VP & Sec: Harrison Doyle
Gen Mgr: L A Applington
MANGANESE KING MINE, 35 mi NE
of Bouse, surface

MANHATTAN CONSOL MINES DEV CO
Box 351, Tonopah, Nevada
Pres: J Fred McColloch
Sec: Nick J Barbarch
SCRIBNER MINE, Box 101, Elfrida,
25 mi NW of Elfrida, undergr, pb,
Ag, As
Idle

MARAVILLA MINERALS CORP
153 S Robertson Blvd, Beverly Hills,
Calif
MONTANA MINE, Santa Cruz, Co,
Pb, Zn, Ag
Res Mgr: Rosa K Oliver, Box 134,
Nogales
Under devel

MARCY-SHENANDOAH CORP
1001 1/2 N Main Ave, Durango,
Colo
Pres & Gen Mgr: S Stokes Tomlin, Jr
VP & Geol: E M Barge
Sec: R M Schell
Treas: Robert R Snodgrass
JACK DANIELS MINE, Cameron,
open pit, U₃O₈, V₂O₅
Mine Supt: G R Green
Asst Mine Supt: F E Peaslee
Prod: 70 tons
(See Colo, Utah)

MASSINGALE, LON
Casa Grande
SILVER REEF, #1 MINE, Pinal
Cty, undergr, Pb, Ag, Cu
Mgr: Lee Hulise
Idle

MAYNARD & RYAN
402 N Humphrey, Flagstaff
U₃O₈ Prod

McCARY BEACON CO
2155 East 7th St, Los Angeles 23,
Calif
U₃O₈ Prod

McFARLAND, E W
Nogales
HOLLAND MINE, Santa Cruz Cty,
surface, undergr, Cu, Pb, Zn

McFARLAND & HULLINGER
915 N Main St, Box 238,
Tocoele, Utah
Own: F G McFarland & S R Hullinger
SAN XAVIER MINE, Box 611, Tucson,
undergr, Pb, Zn, Cu
Gen Supt: Wilmer D Nelson
Geol & Mine Eng: Gerald W Irwin
Prod: 90 tons
400-TON MILL, Sahuarita
Supt: K L Erickson
(See Colo, N Mex, Utah)

McVAY MNG & MILL CO
Wenden
THREE MUSKETEERS MINE, Yuma
Cty, surface, undergr, WO₃
Mgr: Harvey Moore

MEADER, S
Quartzsite
PLUMOSA URANIUM MINE, Yuma
Cty, U₃O₈
Under devel

MELLINGER, PORT B
Box 347, North Lima, Ohio
MT SPRING MINE, Bagdad, undergr,
Pb, Zn, Ag, Au, Cu
Under devel

METATE ASBESTOS CORP
Box 11, Globe
Pres & Gen Supt: Charles Robt Neal
VP & Asst Gen Mgr: Chas Ross Neal
Gen Mgr & Sec: Jack L Neal

Treas: R A McNabb
APACHE & LUCK SEVEN MINES,
San Carlos Apache Indian Reserva-
tion, undergr, asbestos
Mine Supt: Charles Palmer
Asst Supt: Harvey Collins
Prod: 16 tons
BLUE MULE MINE, Bear Canyon,
San Carlos Apache Reservation,
undergr & open pit, asbestos
Supt: G W Haynes
Prod: 1 ton
8-TON MILL, at Blue Mule mine
Mill, at Apache mine
16 tons cobbed ore per day

METBEL MNG & EXPL CO
14471 E Carnell, Whittier, Calif
U₃O₈ Prod

MEX AIR URANIUM CO
Gen Del, Monticello, Utah
U₃O₈ Prod

MIDNIGHT & MIDNIGHT
EXT #1 MINES
Box 1023, Nogales
Own: Val & Margaret Cason
Idle

MINERAL MT M & M CO
330 E 14th St, Tempe
Pres: C M Miller
VP & Gen Mgr: L L Boyer
GORHAM-HALL GROUP, 20 mi SW
of Superior, Pb, Ag, Zn, undergr
WOODPECKER MINE, Pinal Cty,
Ag, As, Pb
Idle
SILVER QUEEN GROUP, 33 mi SW
of Superior, Pb, Ag
Idle

MINES CONTRACTING, INC
Wickenburg
(See Calif)

MONAVE MNG & MLG CO
Box 1108, Wickenburg
Pres: H F Lynn
VP: G S Borden
Sec & Treas: Frank Kohler
Purch Agt: Jack Evans
Mgr: W R Easley
BOX GARDEN MINE, near Wicken-
burg, open pit, Mn
mining by contract
Geol: Earl Whitney
Met: Robert Kidd
Prod: 300 tons
600-TON HEAV-MED MILL, tables
Artillery Peak
Mill Supt: Robert Platt
Mill Frm: Harry Bevington
Assayer: Joe Girard
350-TON PLOT & HEAV-MED
MILL, tables, Wickenburg
Mill Supt: Geo Johnson
Assayer: Lyle Schwader
SINTERING PLANT, Wickenburg

MONICA GROUP
Box 27, Yarnell
Own: C D Howe, John L Riggins,
L J Jaycox
MINE, Yavapai Cty, Au

MONTANA - ARIZONA MNG
CO
Box 16, Lukeville
Mgr: Charles R Anderson
JEFF MILTON OR VERDE MINE, Cu
Idle

MORROW MNG ASSOC
Wickenburg
JUMBO MINE, Maricopa Cty,
surface, Li
Mgr: Robert Pinkerton

MY STATES METALS CO
Yucca
Pres & Gen Mgr: G A Freeman
COPPER WORLD MINE, 15 mi NE
of Yucca, undergr, Cu, Zn
Idle
COPPER WORLD MILL

MT STATES URANIUM CO
1303 Kennedy, Grand Jct, Colo
Pres: A K Wilson, Jr
SAN JUAN MINE, WO₃
Idle

MUD MESA MNG CO
Cortez, Colo
U₃O₈ Prod

NACHENBETAN, FRANK
110 N Orchard Ave, Farmington,
N Mex
U₃O₈ Prod

NASH MINES
406 Nash Bldg, Austin, Tex
Own: Jas P Nash
BONANZA, HOLLAND, KANSAS,
ESTELLA, BELMONT, MAINE,
NEW YORK, INDIANA, DUQUESNE,
& EMPIRE MINES, Patagonia mng
dist
Gen Mgr: D C Gilbert

NASH & McFARLAND
406 Nash Bldg, Austin, Texas
FLUX MINE, Patagonia, undergr,
Pb, Zn, Ag
Gen Mgr: E W McFarland
Asst Gen Mgr: D C Gilbert
300-TON TRENCH MILL, at mine
Assayer: D C Gilbert

NAVAJO TRIBE
Box 146, Window Rock
Chmn: Paul Jones
MINES, undergr & surface, U₃O₈

NETHERLAND, A C
Ajo
LA VICTORIA MINE, Pima Cty, Au

NORTH WEST DEVEL CO
Wickenburg
Mgr: Jack Saye
ABE LINCOLN MINE, Yavapai Cty,
Cu

NUKAL MNG CO
Superior
NUKAL MINE, Pinal Cty, surface,
undergr, Mn
Mgr: Clarence Vessetti
Idle

OAK CREEK MNG CO
Phoenix
OAK CREEK MINE, Gila Cty,
surface, undergr, U₃O₈
Mgr: L E H Huber
Idle

OLD DOMINION GREY GROUP
Box 100, Miami
Own: Miami Copper Co
MINE, Gila Cty, Cu
Idle

OLD GOLD MNG CO
Box 288, Sells
Own & Op: Maurice Hedderman
ALLISON MINE, Sells, undergr, Au,
Si, Ag
Prod: 20 tons

OLD HICKORY COPPER CO
384 N 2nd Ave, Phoenix
Pres: Russell A Wright
LISTA BLUNCA MINE, Caborca,
Son, Mexico, undergr, Cu, Ag, Au
Gen Mgr: Robert Dannelley
Asst Gen Mgr: A E Moorhouse
Geol: F C Ramsing
Idle

ORO BLANCO MINES
Box 66, Ruby Star Rt, Tucson
Gen Mgr: T J Anderson
ORO BLANCO MINE, 15 mi S of
Tucson, undergr, Au, Ag
30-TON GRAY MILL, Santa Cruz
County
Idle

ORO FINO MINES, INC
Box 701, Prescott
Pres: Maurice O Maynard
VP & Gen Mgr: L W Rayner
Sec-Treas: W O Hall
SILVER CROWN MINE, 8 mi E of
Mirkland, undergr, Pb, Ag, Au, Cu
Mine Supt: Sam A Kaster
30-TON MILL, on Wagon Rd 3 mi
from mine
Supt: Robert H Starr
Asst Supt: Ralph W Fairchild

ORO FLAME MNG CO
303 N Pleasant St, Prescott
Mgr: Elmer Snell
ORO FLAME & OHIO MINES,
Yavapai Cty, undergr, Au, Ag, Pb
Idle

OSBORNE, HARRY M
Box 1617, Parker
SUE MINE, undergr, Au, Cu
7-TON MILL
Idle

OTERO, FRANK
233 Sonotta, Nogales,
LOMA de MANGANESE, (SANTA
CRUZ CO) Mn

PAN - AM MNG CO, INC
Panhandle, Texas
Pres & Gen Mgr: Clarence C Williams
VP: C E Lyles
Sec: E G Stapp
Treas: Cyril Pingleton
STARLIGHT MINE, 35 mi SE of
Globe, Ariz, undergr, Cu, Pb, Pb
Gen Supt: Grady Stapp
Geol: Dick N Campbell
Mine Frm: E B Richardson
Under devel

PAUL LIME PLANT
Paul Spur
Pres & Gen Mgr: Alfred Paul, Jr
VP: Virginia Holland Paul
Sec-Treas & Asst Gen Mgr: Howard
E Ames, Jr

MINE, open pit, lime rock
Supt: C T Bishop
Mech Eng: Rafael Sepulveda
Prod: 900 tons
LIME KILNS, rotary kilns, crushing &
grinding & screening plant

DAVE PELAN
201 N 5th St, Grand Jct, Colo
U₃O₈ Prod

PERLITE INDUSTRIES OF
ARIZONA
2123 E Henshaw Rd, Phoenix

Pres: Lewis Williams
VP: Reagan Williams
Sec-Treas: Buster Williams
PERLITE INDUSTRIES MINE,
Superior, open pit, perlite
Gen Mgr: Buster Williams
Supt: Harley Miller
Prod: 35 tons
MILL, Superior, crushing
Supt: Harley Miller

PETTIGREW & DAVIS
Dove Creek, Colo
U₃O₈ Prod

PHELPS DODGE CORP
WESTERN OPERATIONS
Douglas
WESTERN GEN OFFICES
VP, Western Oper: C R Russell
Gen Mgr, Western Oper: W C Lawson
Asst Gen Mgr: J B Pulles
Office Mgr: H E Moore
Dir, Labor Rel: W J Uren
Ch Mech Eng: J H Davis, Jr
Geophys Research: E E Mallott
Gen Aud: G A Swanson
Asst Gen Purch Agt: K A Ables
West Traffic Agt: A C Bacon
MORENCI BRANCH, Morenci,
open pit mines, Cu, Au, Ag, Mg
concentrator & smelter
Mgr: L M Barber
Gen Supt: J A Lema
NEW CORNELIA BRANCH, Ajo,
open pit mines, Cu, Au, Ag,
concentrator & smelter
Mgr: A T Burr
Gen Supt: J A Briggs
COPPER QUEEN BRANCH, Bisbee,
undergr & open pit mines, Cu, Au,
Ag, concentrator
Mgr: C E Mills
Mine Supt: W W Little
DOUGLAS REDUC WKS, Douglas
Smelter
Mgr: C E Mills
Supt: M G Fowler
PHELPS DODGE MERC CO, stores
at Bisbee, Clifton, Douglas, Morenci
Mgr: H L Smith, Douglas
NEW CORNELIA COOP MERC CO,
Ajo
Mgr: H L Smith, Douglas
(See N Mex, N Y, Tex, Wyo)

PHILLIPS ASBESTOS MINE
Globe
Mgr: Guy Phillips
MINE, Gila Cty, surface, undergr,
asbestos
MILL

PIMA MNG CO
Box 7187, Tucson
Pres: H T Mudd
VP: P W Allen, A R Thomas, A D
Christensen, H S Mye
Sec: D P Evans
Treas: C W Stis
Purch Agt: H E Eckstein
PIMA MINE, 35 mi SW of Tucson,
open pit, Cu
Gen Mgr: P W Allen
Res Mgr: E D Spaulding
Asst Res Mgr: A A Friedman
Chief Eng: J F Oik
Geol: J A Journeay
Mech Eng: M H Nicholson
Met: R E Herland

Elec Eng: A G Beehaver
Mine Supt: J E Thummond
Asst Mine Supt: J Starabinski
Mine Frnt: D A Rich
Ming Eng: M D Martin
3,500-TON FLOT MILL: at mine
Mill Supt: G A Komadina
Mill Frnt: Maurice Conliffe
Assay: P Flores
(See Calif)

PINAL COPPER MINES
c/o Herman D Rhee, Florence
PINAL COPPER MINE, Pinal Cty,
Id
Id

POWER, J F
Yuma
CIBOLA #1 MINE, Yuma Cty,
surface, undergr, Ma
Mgr: C J Hanshaw

RARE METALS CORP OF AMERICA
1st Security Bldg, Salt Lake City 11,
Utah
Supt of Oper: A A McKinney
Prod: 110 tons
RAMCO PROPERTIES, Cameron,
Navajo Indian Reservation, Coconino
Cty, open pit, U₃O₈
Gen Supt: James McFarlane
Mine Supt: J C McFarlane
Eng: W L Fugate
Prod: 180 tons
280-TON ACID-LEACH MILL, Tuba
City
Mill Supt: S M Runke
Asst Mill Supt: L O Davis
Mill Frnt: L W Mead
Met: W A Griffith
Chemist: G L Botte
(See Idaho, Calif, Utah)

RAY MNG CO
c/o Vernon Wilden
Shiprock, N Mex
BLACK #1 MINE, Apache Cty,
surface, undergr, U₃O₈, V
Id

RED BLUFF MNG CO
Young Rd, Globe
RED BLUFF MINE, undergr, U₃O₈
Gen Mgr & Mine Supt: Carl Larden
Id

RED CLOUD GROUP
Own: M L Lynch, John W Lallier,
Prescott
MINE, 8 mi SW of Bagdad, diamond
drill explor
Id
(Sub-leased to Cyprus Mines Corp)

REYMERT EXT SILVER MINES
Hox 521, Superior
Pres & Gen Mgr: Norman De Vaux
Vp: Ray N Mattinger
Sec: Neil H McGinnis
Gen Supt: Fred A Bennett
REYMERT MINE, 7 mi W of
Superior
Id

RICO MNG CO
Agua
Mgr: P D Evans
INLA CHANCELAN MINE, Yavapai
Cty

RIO DEL MONTE MINES, INC
Salme
Pres & Gen Mgr: O K Gilliam
Vp: Emil Anderson
Sec: E V Eckel
RIO DEL MONTE MINE, 4 mi SW
of Salme, undergr, Au, Ag, Cu, Pb
Id
GHAY MILL

ROXY ENTERPRISES
201 N Stone Ave, Tucson
Pres: Louis Surroto
PITTSBURGH GROUP, Santa Cruz Cty,
Cu, Zn, Pb, Ag
Under devel

S W MNG INDUSTRIES
1415 S Sixth Ave, Tucson
SERASIO MINE, Cu
Id
(Leased from Mike Serasio)

SABER MNG CO
c/o R M Rutledge, Safford
Mgr: R M Rutledge
BLACK HAWK MINE, Graham Cty,
Mn
Id

SALERNO METALS CORP
c/o J W Crotty, Patagonia
ALICE BLUE GROUP, Santa Cruz
Cty, Cu
Id

SAN MANUEL COPPER CORP
Box 5417, San Manuel
Pres: W P Goss
VP & Sec: R C Bonebrake
Treas: W P Schmid
Purch Agt: J A Gardner
SAN MANUEL MINE, undergr, Cu,
Mo, Au, Ag
Gen Mgr: F H Buchella
Asst Gen Mgr, Oper: J F Buchanan
Mine Supt: C L Pillar
Asst Supt: E K Suley
Geol: J D Follister
Mech Supt: C A Bilton
Met: H K Burke
Ch Mng Eng: H J Steele
Mine Frnt: C F Cigliana
Prod: 30,000 tons
30,000-TON FLOT MILL
Supt: E V Given
140,000,000 LBS REVERB SMELT
Supt: R C Wilson
Gen Frnt: L Redmond
Asst Supt: John Cullom

SANDERS MINE
Banders
Mgr: C A McCarrell
MINE in Apache Cty, bentonite

SAN RAMON MINE
4534 E Broadway, Tucson
Own: Bob Cruise
MINE, 18 mi NW of Patagonia,
undergr, Pb, Cu, Ag, Zn
Id

SANDERS, WILLIAM W
Portia
LEADVILLE MINE (COCHISE CTY),
Pb

SANTA CRUZ COPPER CO
2307 E Waverly Tucson
Pres: D M Stranahan
VP: L J Lichty
Sec: Victor H Verity
Treas: A K Barranco
VOLCANO & SUNNYSIDE MINES,
Patagonia, Cu
Id
SAN MIGUEL MINE, Salome
Id

SANTA TERESA MNG CO
Safford
Sec: Paul Merrill
SANTA TERESA & FAIRVIEW
MINES, Graham Cty, Pb
Id

SCHOLZ, E A & CALIER, J H
Bagdad
COPPER KING MINE, 7 mi S of
Bagdad, undergr Zn, Cu
Under devel
(Leased to Wah Chang Mng Corp,
Bishop, Calif)

SEIFERT & SMITH
Agua
BLACK QUEEN MINE, Maricopa
Cty, surface, undergr, Mn
Mgr: Fred Seifert
Id

SEIN FEIN MNG CO
Klondyke
Pres: Dean Nicholson
MINE, Aravaipa dist, undergr,
surface, Au, Ag, Cu, Pb
Id

SELLS, CATO
P O Box 253, Farmington, N Mex
U₃O₈ Prod

SEQUOIA MNG CO
218 Palm Ave, Imperial Beach,
Calif
U₃O₈ Prod

SEVIER MINERALS CO
Box 185, Richfield, Utah
Pres: Wm R Robertshaw
Gen Mgr: Wm Howard
GOLDEN GEM MINE, 12 mi N of
Kingman, undergr, Au, Ag, Zn,
Pb, Cu
Mine Supt: Wm Howard
Mine Frnt: Charles E Barnes
50-TON FLOT MILL, at mine
Assay: William Kern

SHANNON MNG CO
Box 38, Tombstone
Pres: M Blumberg
VP: L Blerkey
Sec: J Flory
SHANNON MINE, Cochise Cty,
undergr, Cu, Zn, Pb
Gen Mgr: J W Faust
Mine Supt: L J Conley
Mine Frnt: J Perotti
Prod: 75 tons
Id

SHAPLEY PROCESSING CO
1448 E Town & Country Lane,
Phoenix
Own & Op: Cooper Shapley, Jr
MINE, undergr, open pit, CaF₂
Id
MILL, 22 mi SW of Aguila, Ariz

SHATTUCK DENN MNG CORP
120 Broadway, New York 5, NY
Pres: Thomas Rardon
VP: S S Shattuck
Exec VP: Thomas V Tozzi
Asst VP: D M Kentro, T W Newell
Sec-Treas: John A Moss
IRON KING MINE, Humboldt, undergr,
Zn, Pb, Au, Ag, Cu
Gen Mgr: D M Kentro
Met Supt: A W Jeffers
Chf Eng: L Bombardieri
Mech Eng: R Waples, Jr
Chf Clk: W Richardson
Purch Agt: J O MacGregor
Mine Supt: Elmer Tomkinson
Mine Frnt: Claude Apperson
1,100-TON FLOT MILL, at mine
Supt: Thomas L Hoskins
Asst Supt: D Barnard
Assay & Statist
(See Colo, NY)

SIERRA ANCHA MNG CO
Globe
URANIUM CLAIMS, Gila Cty
Id
(See Colo)

SIERRITA MNG & RANCHING CO
Box 25, Ruby Star Rt, Tucson
Treas: Leander M Harris
GOLDEN FLEECE MINE, Pima
Cty, Au
Id
COWBOY MINE, Pima Cty, Pb, Ag,
Zn
Id
OLD POWERS MINE, Pima Cty, Cu

SILVER FLAKE MINE
308 S Marma St, Prescott
Own: W R Fitzgerald
MINE: 5 mi S of Prescott, undergr,
Zn, Pb, Ag, Au, Co
Geol: W M O'Dell
Id
MOLLY MINE, Mo, Ag, B, Ni, Cu
Gen Mgr: W M O'Dell
Under devel

SILVER REEF MINE
Box 492, Casa Grande
MINE, 13 mi S of Casa Grande,
undergr, open pit, Ag
Id

SISKON CORP
Box 889, Reno, Nev
AMERICAN EAGLE & OLD
RELIABLE MINES, Cu
Mine Frnt: M R Biswell, Box 88,
Mammoth
GLOBE & PRINCE MINES, Cu
Mine Frnt: M R Biswell
(Leased from Phelps Dodge Corp)
(See Calif, Nev)

SITTON & CO
1135 W McDowell Rd, Phoenix
KANAB #4 & LONE WOLF MINES,
Maricopa Cty, Mn

SKILES OIL CORP
Skiles Bldg, Mt Carmel, Ill
U₃O₈ Prod

SMITH, H C
Globe
LITTLE JOE MINE, U₃O₈

SMITH, GEORGE W SR
Cortez, Colorado
Mn Prod

SNYDER M & M CO
Box 41, Sonoma
Mgr & Own: Phil Snyder
CONGLOMERATE MINE, Pima Cty,
Cu
Id

SOREN ASBESTOS CORP
Box 1431, Globe
Pres: Wm W Soren
VP: Vance Thornburg
Sec: Loraine Soren
SALT RIVER GROUP, Gila Cty,
undergr, asbestos
Id

SOUTHERN CROSS MNG CORP
Box 47, Quartzsite
Mgr: L A Aplington
LUCKY LEAD #1-8, 10 mi S of Bouse,
undergr, Pb, Zn, Ag, Au
Id

SOUTHWEST MINES CONTR CO

Box 1041, Prescott
Gen Mgr: Joe Ward
GREAT SCOT MINE, 19 mi SE of
Prescott, undergr, Pb, Zn, Au, Ag
WHITE PEARL, 7 mi S of Prescott,
undergr, W₃
Id

SOUTHWEST MNG INDUSTRIES
4th E 3rd St, Tucson
Pres: Herb C Brauchla
Gen Mgr & Geol: H Clyde Davis
NORTH STAR MINE, undergr & open
pit, Cu, Au, Ag
Under devel

SPAR MNG CO
Box 88, Ft Thomas
Pres: Wm C Rhodes
Supt: C H Rhodes
SPAR MINE, undergr & open pit,
CaF₂
Id

SPARKES, GRACE M
Star Rt, Hereford
Star Rt, Hereford
STATE OF TEXAS MINE, Star Rt,
Hereford, 25 mi W of Hisebo, under-
gr, Zn, Pb, Ag, Au
Id

SPARTAN MNG CO
544 Reale St, Kingman
DEMOCRAT MINE, undergr, U₃O₈
Gen Mgr: Charles E Howell
Asst Gen Mgr: Ralph E Anshp
Gen Supt: Dick Hart
Geol: Lorenzo Demars

SPEARS, CARL N
P O Box 1287, Yuma
U₃O₈ Prod

SPENCER URANIUM MNG
Atlas Bldg, Salt Lake City, Utah
U₃O₈ Prod

STANLEY BUTTE MNG CO
Box 11, Safford
Pres: R W Annis
VP: C H Heire
Sec: E E Miller
Treas: C G Watson, Safford
PRINCESS PAT MINE, Safford,
undergr & open pit, Cu, Ag, Zn, Au
Gen Mgr: Reed R Crunk
Asst Gen Mgr: Lyman B Crunk
Gen Supt: Vernon D Crunk
Geol: A E Gibbert
Mech Eng: E Purvis
Met: Ed Smith
Elec Eng: H L Annis
Under devel

STEINBERGER DRILLING CO
Cameron
Pres: H Steinberger
ALYCE TOLINO, JULIA SEMOLLIE
& JUAN HORSE MINES, Camarop,
open pit, U₃O₈
Under devel

STETTER, J J
Box 27, Quartzsite
TUNGHILL, W₃
Id

STOVAL MANGANESE MNG CO
550 W Van Buren St, Box 883,
Phoenix
LSAA MINE, Superior, Pinal Cty,
undergr, Mn
Mine Supt: O K Mills

STURDIANT & FISHER
Florence
ZIG ZAG MINE, Pinal Cty, Mn
Mgr: E J Sturdivant

SUMMIT COPPER MINES, INC
Box 184, Payson
Pres & Gen Mgr: R W Thompson
VP: Dr A L Gagner
Sec: Nina M Thompson
SUMMIT MINE, 6 mi NW of Payson,
undergr, Cu, Au
50-TON GRAY MILL
Idle

SUN - GOLD MNG CO
711 Valley Nat'l Bldg, Tucson
Pres & Mine Supt: Alfred E Turner
Sec-Treas & Gen Mgr: John C Guang'l
SUN-GOLD GROUP, Pima Cty,
undergr, Au, Ag, Pb, Cu
Idle

SUNRISE MNG CO
Box 52, Amado
Pres: V P Simons
Res Mgr: G W Irwin
GLOVE MINE, 8 mi E of Amado in
Santa Rita Mts, undergr, Pb, Ag, Zn,
WO₃
Prod: 30 tons
(See Texas)

SUNSET MNG CO
213 Minna St, San Francisco, Calif
Pres: J L Balocchi
VP: W O Kay
Sec: Charles Greenberg
MINE, Pinal Cty, Au, Ag, Cu
Idle

SUNSHINE MNG CO
378 Peyton Bldg, Spokane, Wash
Res Mgr: Earl Ellstone, Swissheim
Lodge, Elfrida
HIGHLAND MINE, Chocoma Cty, Cu
(See Idaho, Utah, Wash)

SUPERIOR INDUSTRIES, INC
309-U Meadows Bldg, Dallas, Tex
Pres & Purch Agt: O T Ball
VP: W C Maney
Sec-Treas: Inez Gibson
MARY T & SANDY NO 2 MINES,
Superior, open pit, perlite
Gen Mgr: O T Ball
Asst: Marion Mognett
Idle

TEJON MINE LSG & DEV CO
Box 503, Tombstone
Own: William Ward
TEJON MINE, 18 mi NE of Tomb-
stone, undergr, Cu, Pb, Au, Ag
Under devel

TEJON TOM SCOTT MINE
c/o Ignacio Vales, Gleason
MINE, Cochise Cty, undergr, Cu
Idle

THOMAS, B J & ROGRINA
4402 E Scarlett St, Tucson
U₃O₈ Prod

THREE C RANCH MINE
3C Ranch, Oracle
Own & Oper: Mary West
MINE, Pinal Cty, Au, Ag
MILL, at mine
Supt: Owen Wade

THREE R MINE
Patagonia
MINE, Santa Cruz Cty, Ag, Cu, Pb
Idle

TIP TOP MNG CO
Box 27, Sahuarita
FORBES MINE, Pima Cty, Cu

TITAN URANIUM CO
c/o A J Giannini, Albuquerque,
N Mex
R F & R MINE, Apache Cty, surface,
undergr, U₃O₈, V

TOUT, EDWIN I
Tucson
TOUT MINES, INC, Cochise Cty,
surface, undergr, Cu
Idle

TRETTLE, L V
c/o Gen Delivery, Cameron
U₃O₈ Prod

TRUE BLUE MNG CO
Salina
TRUE BLUE MINE, Yuma Cty,
surface, undergr, Au, Ag
Mgr: H L Cast
Idle

TULSA MINERALS CORP
Box 1652, Globe
Pres & Gen Mgr: J S Burden
VP: P T Thibodeaux

Sec & Treas: W G Eastman
Purch Agt: John W Cleary
LUCKY BOY & SUCKERITE MINES,
Gila Cty, undergr, U₃O₈
Asst Gen Mgr & Geol: H F Beasley
Gen Supt: Everett Costle
LUCKY BOY FRM. K M Craig
Suckerite FRM. John L Carter
Idle
BOUTAIL MINE, 14 mi S of
Globe, undergr, Cu, Ag, Au, Pb,
Zn, WO₃
Mine Supt: Everett L Costle
Geol & Asst Gen Mgr: H F Beasley
Under devel
(See Okla)

TURKEY CREEK PLACER
Cleator
OP: Thomas R Cleator,
MINE, Yavapai Cty, Au
Idle

TWIN STAR INDUSTRIES, INC
1820 E Hampton St, Tucson
Mgr: C Neil Vogel
WHITE CLIFF MINE, open pit,
disminuous earth
Under devel

TWIN STATES URAN CORP
P O Box 1471, Winslow
U₃O₈ Prod

UNION GYPSUM CO
Winselman
UNION GYPSUM MINE, Pinal Cty,
surface, gypsum
Mgr: Archie Lee

UNITED MINERALS CORP
518 Felt Bldg, Salt Lake City, Utah
Pres: George W Snyder, Jr
VP: G W Snyder, H A Corey
Sec: Guy Snyder
HIP VAN WINKLE & LUCKY STRIDE
MINES, undergr
Idle
(See Nev)

**UNITED STATES SMELTING
REFINING & MNG CO**
7b Federal St, Boston, Mass
Pres: F S Mulock
GOLD MINE, Mohave County
Idle
(See Alaska, Mass, N Mex, Utah)

**URANIUM & OIL LEVEL
PROJECT, INC**
3414 N 14th St, Phoenix
Pres & Gen Mgr: Guy J Stumpff
VP: Ernest Feighner
Sec-Treas & Geol: F H Lund
LUCKY HORSESHOE MINE, Gila
Cty, open pit, U₃O₈, rare earths
Idle

U S GUANO CORP
Box 386, Kingman
Pres & Treas: Charles F Parker, Jr
VP: Thomas A McGovern
Sec: R M Nichols
Office Mgr: M F Crumpton
BAT CAVES, Grand Canyon, Guano
Gen Mgr: Varley Crumpton
Gen Supt: B A Freiday
Prod: 25 tons

U S LIME PRODUCTS CORP.
GRAND CANYON LIME &
CEMENT CO DIV
2344 Beverly Blvd, Los Angeles,
Calif

NELSON PLANT, open quarry,
west Kings
Supt: Roy Lauer
(See Calif, Nev)

U S TUNGSTEN CORP
Box 506, Congress
Pres: J P Zannaras
VP: Charles P Lower
Sec: John P Robinson, Jr
ZANNARAPOLIS MINE, 35 mi NW
of Congress, undergr, surface,
schweilite
Idle

Mine FRM. L M Rutledge
350-TON GRAY - FLOT MILL
Mill FRM: Jess Parrie

UNIVERSAL COPPER CORP
2603 E Third St, Tucson
Pres: James E Gaylor
ALICE MINE, undergr, Cu, Pb, Au
Under devel

URAINBOW, INC
906 Kearns Bldg, Salt Lake City,
Utah
Pres: Henry B Squires
VP: Robert W Shields

Sec-Treas: Val S Scoville
HACKS CANYON MINE, Fredonia,
undergr, U₃O₈, Cu
Undergr production
Mine Supt: Lou Scoville
Idle

**URANIUM EXPL & COPPER
CO**
3411 W 14th Place, Phoenix
Sec: P H Lund
U₃O₈ Prod

URANIUM PETROLEUM CO
53 East 4th South, Salt Lake City,
Utah
U₃O₈ Prod

URANIUM RESERVE CORP
c/o Win Mower, Shuf, Colo
CAFO SELLS TRACT, Apache Cty,
surface, undergr, U₃O₈, V

UTAH SOUTHERN OIL CO
901 Utah Oil Bldg, Salt Lake City 1,
Utah
U₃O₈ Prod

UTCO URANIUM CORP
310 1st Nat'l Bank Bldg, Denver,
Colo

Pres: Geo S Casey
VP: Fred C Clymer
Sec: H Clark Thompson
Treas: John Aiff
Asst Treas: J D Vander Ploeg
HUSKON #4-18 MINES, Cameron,
open pit, U₃O₈
Gen Mgr & Geol: Mason W Rankin
FRM: Charles Huskorn
Prod: 200 tons
(See N Mex, Utah)

VANADIUM CORP OF AMER
Durango, Colo
MONUMENT #2 MINE, Monument
Valley, open pit, U₃O₈, V₂O₅
Mine FRM: Fred Polarsen
(See Colo, N Mex, N Y, Utah)

VASSER, C F & BILL
Box 322, Salome
JACK POT #1, WO₃
Idle

VENTURES, LTD
Patagonia
VULCANO & PINA GROUP, Santa
Cruz Cty, Ca

**VERDE VALLEY INDUSTRIES,
INC**
c/o Riney B Salmon, Phoenix
Title & Trust Bldg, Phoenix
Sec-Treas: Riney B Salmon
UNITED VERDE MINE, Yavapai
Cty, Cu
Idle

**VERMILION CLIFFS MNG
CORP**
Box 1637, Flagstaff
Pres: C E Knowles
VP: R E Darling
Sec-Treas & VP of Oper: Allen C
Tester
MINES, Cameron, Ariz area, Navajo
Indian Reservation, open pit, U₃O₈
Idle
(See N Mex)

VERNON, LEWIS & DAVIS
Willcox
V L & D MINE, Cochise Cty, surface,
undergr, Au
Mgr: Ben Lewis
Idle

VIA DEVELOPMENT CORP
Box 4364, Santa Fe, N Mex
Pres: C W Via
Sec-Treas: Hilliard Crown
MANGANESE MINE (leased to
Charles H Jonas, Phoenix)
ASBESTOS MINE (leased to Reynolds
Falls Asbestos, Inc, Phoenix)

WALAPAI HUALAPAI
Yucca
BONNY RUTH MINE, Mohave Cty,
surface, undergr, WO₃
Mgr: Frank McCarty
Idle

WARREN, EDWIN D
Pacific Palisades, Calif
U₃O₈ Prod

WEST COAST MINERALS
Flagstaff
WHITE MESA MINE, Cu
Idle

**WESTERN GOLD & URANIUM,
INC**

Box 156, St George, Utah
Pres: Ralph G Brown
VP & Treas: David P Shirra
Sec: Eugene Backus
Mng Dir: Charles E Prior
ORPHAN LODGE MINE, Box 85,
Grand Canyon, undergr, U₃O₈
Gen Supt: Richard V Wyman
Chf Geol: Max E Kofford
Met: Jack K Howell
Mine Supt: Patrick E Sayre
Mine FRM: Ted Snyder
Prod: 30 tons
BROWN-HENDERSON, Humboldt,
Zn, Cu
Idle
CROWNED KING MINE, Crown King,
Au,
Idle
PARASHANT MINES, Mohave Cty,
Cu, U₃O₈
Geol: Robert F Hartmann
Under devel
(See Colo, Utah)

**WESTERN MNG & EXPLORA-
TION CO**
940 Ash Ave, Tempe
BLACK BRUSH MINE, U₃O₈
Mgr: C A Saylor
Idle

WESTMINSTER CORP
415-20 1st Nat'l Bank Bldg,
Denver, Colo
Pres: David W Adams
VP: Melvin C Bowles
VP & Treas: T B Liawellyn
Sec: Miss T Holman
PINE MTN & MERCURIO MERCURY
MINES, Maricopa Cty, Hg
(See Colo, Nev, Utah, Wyo)

WILKERSON, J L & CO
Crown King
Mgr: Ed W Carls
SAVOY MINE in Yavapai Cty, Pb, Ag
Under devel

WILKINS MINE GROUP
Box M, Patagonia
Own: Bond Trust
Leasee: Sunburst Mining Co
MINES, Santa Cruz Cty, undergr,
Pb, Zn, Cu
Gen Mgr: John Campbell

C D WILSON MNG
Box 102, Sahuarita
Op: C D Wilson
MINE, Pima Cty, open pit, Cu, Ag,
Au
Prod: 250 tons

WORLD MANGANESE CORP
Box 37, Wenden
BLACK JIM MC GREGOR,
MC GREGOR & NEEDLE EYE
MINES, Mohave Cty, Ma
Idle

YELLOW JEEP MNG CO
2494 Glen Canyon Rd,
Altadena, Calif
U₃O₈ Prod

**YELLOW OXIDE MINE, A
PARTNERSHIP**
c/o Mgr E S Thelma, Globe
MINE, Gila Cty, surface, Mn

YUCCA MNG & MNG CO
Box 67, Yucca
Pres & Gen Mgr: R J Dalton
VP: Ferd Wolf
Sec: Ben F Williams
ANTLER MINE, 11 mi E of Yucca,
undergr, Cu, Zn, Ag, Au
Prod: 150 tons
150-TON FLOT MILL
Idle

ZODIAC URANIUM, INC
330 Ness Bldg, Salt Lake City,
Utah
Pres: Leo G Bateman
VP: M G White
Sec: Paul Jones
Treas: Gladys D Hervey
NAVAJO INDIAN RESERVATION
MINE, surface, U₃O₈
Geol: Leland J Davis
Under devel
(See Mont)

ARKANSAS

ALUMINUM CO OF AMERICA,
MNG DIV

1504 Alcoa Bldg, Pittsburgh 13, Pa
Pres: F L Magee
VP/Of Mng Div: Lawrence Litchfield,
Jr

Treas: E B Wilmer
Sec: A M Hunt
Gen Purch Agt: R O Keffer
MINES, Bauxite, bauxite
Gen Mgr: J T Waiters
Asst Gen Mgr: H W Rucker
Geol: G C McBride
Mine Supt: J E Cole
Mine Eng: R L Schell
Prod: 3,000 tons
(See Ill, Pa)

AMER CYANAMID CO

Box 736, Little Rock
MINE, 4 mi S of Little Rock, surface,
bauxite
Mine Mgr: R H Harris
(See Fla, Ga, NY, Va)

APEX MNG CO

Cushman
MINES, Cushman, open pit, Mn

ARKANSAS GYPSUM CO

Murfreesboro
Pres & Gen Mgr: Vernon B Lewis
GYPSUM MINE, Murfreesboro,
undergr, surface

ARKANSAS MNG & EXPLOR

CO
Batesville
MINES, N of Batesville, open pit, Mn

BAXTER, LEONARD

Cushman
MINES, Cushman, open pit, Mn

DICKINSON - McGEORGE,

INC
Box 248, Pine Bluff
MINE, bauxite

DULIN BAUXITE CO

Sweet Home
MINE, bauxite

HARGUS MNG CO

Mena
Pres: Will H Hargus
VP: Will H Hargus, Jr
MINE, Polk Co, open pit, Mn
Prod: 18 tons
Under devel
Geol: William Campbell
Assayer: Bruce Williams

MAGNET COVE BARIUM

CORP
Box 6504, Houston 5, Texas
MINE, Magnet Cove, undergr,
barite
Gen Mgr: James S Sparks
Mine Supt: Marvin Verser
Chf Mgr: Fred Scharf
Met: B C Harding
Geol: Harry Metcalf
Prod: 1,200 tons
1,200-TON FLOT-MILL, Malvern
Supt: E H Spraggins
(See Fla, Mo, Nev, Tex, Wyo)

MILLER & MC GEE

Batesville
MINES, N of Batesville, open pit
& undergr, Mn

NATL LEAD CO, BAROID

DIV MAGNET COVE OPER
Malvern
MINE, 12 mi N of Malvern, surface,
Ba
Supt: E C Farrell
Asst Supt: W A Halbert
100-TON FLOT MILL
(See Calif, Kans, Ia, Mont, Mo,
Nev, NY, Tenn, Tex & Wyo)

POROCCEL CORP

Menlo Park, N J
Pres: W W Gary
VP: A G Blake
Sec: M C Flint
Treas: C W Wilson
Prod Dir: T L Walker
MINE, Berger, open pit, bauxite
Mgr: M N Rowland

REYNOLDS MNG CORP

Boyle Bldg, Little Rock
Pres: Walter L Rice
VP: R H Ziegler
Sec: Allyn Dillard

Treas: C E Coghill
Purch Agt: M W Henry
REYNOLDS MINE, Box 306, Bauxite,
undergr, open pit, bauxite
Gen Mgr: R H Ziegler
Supt, open pit: H T Middlebrook
Supt, undergr: G M Wagner
Elec Eng: J T Harper
Local Purch Agt: J W Glover
Asst Mine Supt: J A Fuller
Mine Eng: J R Krause
Prod: 3,000 tons
(See Colo, Va)

UTLEY, HARVEY *

Box 431, Batesville
MINES, N of Batesville, open pit, Mn
10-TON MILL, Ind City
Assayer: Bruce Williams

CALIFORNIA

AJAX TUNGSTEN CORP

137 S Main St, Bishop
Pres & Gen Mgr: C H Hall
VP: George Temple, Gayle Green
Sec: Bruce R Thompson
Treas: J E Snelson
TUNGSTAR, HANGING VALLEY
FERNANDO-DURHAM MINES,
undergr, Wyo
Gen Supt: J E Escala
Mine Supt: Geo L Hall
Prod: 100 tons
100-TON GRAV MILL, Bishop
Mill Supt: Day Johnson
Idle

ALHAMBRA CONSOL MINES

INC
1903 Outpost Dr, Hollywood
Pres & Gen Mgr: O H Griggs
VP: Walter W Smith
Sec & Asst Gen Mgr: Joseph Rego
Treas: Frank C Weller
ALHAMBRA MINE, Box 737,
Placerville, undergr, Au
Mine Supt: Chris Matkevich
MILL, at mine
Prod: 40 tons
Idle
(See Nev, Utah)

ALLEN, E E

145 Persia St, San Francisco
FIDELITY MINE, Glencoe Dist, Au

ALLIANCE TALC MINE

Darwin
Op: George W Koest
MINE, 17 mi E of Keeler, steatite
talc

ALMADEN DUMPS

Almaden
MINE, Santa Clara County, Hg

ALTA COPPER CO, INC

Box 308, Gasquet
Pres & Gen Mgr: Joe Reinard
Sec: Ralph Yoder
Geol: Roger Beale
ALTA COPPER MINE, 8 mi E of
Smith Riv, Del Norte Co, undergr, Cu
Idle

AMERICAN ASBESTOS MNG

CORP
11 W 42nd St, New York
MINE, Calaveras Co, asbestos
Idle
VOORHES MINE, Copperopolis,
asbestos

AMERICAN CHROME CO

1 Montgomery St, San Francisco
Pres: Willis A Swan
VP & Gen Mgr: John Bley
Sec: Geo M Spradling
Treas: John L Lukens
Purch Agt: D W Graves
MOUAT MINE, Rye, Montana
(See Montana)

AMERICAN INTERNATL MNG

& MLG CO, INC
1533 Riverside Dr, Los Angeles
Pres & Gen Mgr: Clemens M Roark
VP-Sec: Gene Loose
Treas: J Roy Owens
ITALIAN-FREMONT-COVER MINE,
Drytown, undergr, Au, Ag
Gen Supt: Harry Palmer
Geol: T M Dunliffe
Under devel
100-TON MILL, Drytown

AMERICAN MINERAL CO

840 S Mission Rd, Los Angeles 23
Pres: A H Stahmer
VP & Gen Mgr: W A Marie
WHITE ROCK MINE, 12 mi NW of
Canby, surf, ceramic clay
Prod: 400 tons per mo
Mine Supt: Paul Edgemon
100-TON MILL, Los Angeles,
commercial grinding
CLAY PIT, Kern County

AMERICAN POTASH & CHEM

CORP
3030 W 8th St, Los Angeles 54
Pres: Peter Colefax
VP, Sales: Wm J Francis
Sec: Richard J Hefler
Treas: Lawrence A Adams
Purch Agt: Lawrence H Cornelius
SEARLES LAKE MINE, Lake Brines,
Trona, potash, borax, soda salts,
Br, Li
Gen Mgr: M L Leonardi
MILL & SMELTER, Trona

AMERICAN SMELTING &

REFINING CO
405 Montgomery St, San Francisco
MINING DEPT
Res Geol: L K Wilson
Sec: Richard J Hefler
Mgr: W S Reid
Asst Mgr: G H Playter
Gen Supt: B K Shedd
Purch Agt: J M Hanna
Smelter Supt: F C Moran
Refin Supt: Al Lobbe, Jr
Main Mech: J L White
(See Ariz, Colo, Idaho, Ill, Kans, Mo,
Mont, Nebr, N J, N Mex, NY, Tex,
Utah, Wash, and Federal Mng & Smelt-
ing Co, Mo)

ANACONDA COMPANY, THE

25 Broadway, New York 4, NY
Pres: Clyde E Weed
Exec VP: Edward S McGlone
VP, Western Oper: C H Steele,
Butte, Mont
Sec-Treas: C Earle Moran
DARWIN MINE, Darwin, undergr,
Pb, Zn, Ag
Idle
FLOT MILL, Darwin
Idle
SHOSHONE MINE, Tecopa, undergr,
Pb, Ag
Idle
125-TON FLOT MILL, at Shoshone
Idle
(See Idaho, Mont, Nev, N Mex, NY,
Utah)

ANDREWS MNG CO

Box 492, Healdsburg
Pres: Lowell Andrews
VP: Mel Woods
Sec: Merle Heffley
CRYSTAL MINE, 19 mi NE of
Healdsburg, undergr, cinnabar
Own: P G Cox
(Leased to Andrews Mng Co)
Under devel

ARGENTINA CONS MNG CO

1235 Capitan Dr, Glendale
Pres: Harry Lee Martin
VP & Sec: Edwin C Horrell
MINE, Ag, Pb, Zn, V₂O₅
Idle
(See Nevada)

ARGO, ROY, BORTHING, E S

& GRIFFITHS, LAWRENCE
CO-OWNERS
c/o Roy Argo, 1837 S Loma Dr,
Whittier
LILLY #1, 2, 3, 4 MINES, Slate
Range dist, undergr, Au, Ag, Pb,
Cu, Mn, U₃O₈
Supt: Roy Argo
Assay: Smith Emery
Idle

ASHLAND MNG CO

423 "J" St, Crescent City
MINES, Del Norte Co, Cr
FAIRVIEW MINE, Hamburg, undergr,
Cr

ASH, WM L

55 Davis St, Quincy
MT HOUGH & PIONEER MANGANESE
MINES, Imperial Co, Mn

BACKELS, ANDREW & PAUL

80 Pierce St, San Francisco 17
EMPIRE-LONE STAR GROUP, 12
mi NE of Downsville, undergr, Au
MEXICAN MINE, 2 mi E of
Goodyear's Bar, Au
Idle

BARIUM PROD. LTD

(Subd of FOOD MACH & CHEM
CORP)
SAVERCOOL MINE, Flamingo, Wyo,
barite
Idle
ALMANOR MINE, Greenville
Idle
(See Barium Products, Nevada;
Intermountain Chem, Wyo)

BEAM SMELTERS &

IMPERIAL MINES, INC
10535 Buford Ave, Inglewood 2
Own: L Mills Beam
IMPERIAL DIGGINGS, LUCKY JACK,
PIONEER, SARA ALICIA, GOLDEN
EAGLE, GOLD FIELDS, undergr,
open pit, Au, Co, WO₃, Cu, Mn
Prod: 3,000 tons

BECK, MARTIN

Box 343, Mojave
GUNTREE MINE, Kern Co, WO₃, Sb
Idle

BEDELL, STUART

Big Pine
WAUCALIA MINE, Inyo Co, WO₃
Idle

BELDEN AMADOR MINES,

INC
Box 30, Pine Grove
Pres: Donald Griffin
VP & Gen Mgr: Leon M Banks
Sec: Don A Weber
BELDEN MINE, Pine Grove, 20 mi
E of Jackson, Au, Ag
Idle
40-TON GRAV FLOT MILL

BENOIST, M L

Box 283, Weaverille
CHLORIDE & GLOBE MINES, 23
mi from Weaverille, undergr,
surface
Idle
30-TON MILL

BEST MINES CO

Box 177, Downsville
Pres: L L Best
VP: B C Austin
Gen Mgr: L L Hueland
GOLD BLUFF, BRUSH CREEK &
OXFORD MINES, undergr, Au
Mine Supt: W T Reed, Jr
Eng: B C Austin
Master Mech: A R Hinton
FLOT MILL
Supt: John Folsom
Frm: Vernon Huffman

BIG CHIEF MERCURY MINES

Box 235, Middletown
Own: W L MacKinnon
BIG CHIEF MERCURY MINES,
undergr & open pit, Hg
Asst Mine Supt: Eddie Austin
Under devel

BIG FOUR MNG & MLG CO

P O Box 218, Lomita
Pres: Lester G Michaelis
VP: Sim M Bramlette
Treas: Harold Brett
Purch Agt: Roy Johnson
MINES, Clima, Paris Lorraine,
Kramer, open pit, placer, Zr,
U₃O₈, Ba, magnetite, Th
Mine Supt: Roy Johnson
Asst Mine Supt: Sim Bramlette
Under devel
(See Nev)

BIG SEVEN MNG CO, INC

223 S "C" St, Lompoc
Pres & Gen Mgr: D E Neuschwander
VP & Geol: R G Hendy
Sec-Treas & Mech Eng: R E Fortin
Gen Supt: O C Benedict
BRIGHT FUTURE MINE, Idria Mng
dist, San Benito Co, open pit,
Cr₂O₃
Prod: 30-50 tons
(Leased to Hampton Mining Co)

BLACK SCORPION MNG CO

Hardin Flat, Groveland
Part: H L Quinn & P Sustich
BLACK SCORPION MINE, 24 mi E
of Groveland on Hwy 120, undergr,
Ag, Au
Under devel

BLACK GIRL MINES CO

P O Box 1, Death Valley &
Box "M", Oroya, Colo
VP & Gen Mgr: J M McFadden
Sec: Doris E McFadden
Geol: C M Shaw
(See Colo)

BLACKSTONE MINES, INC
5306 Barrett Ave., Richmond
Pres: Lawrence A Sanchez
VP: Louis G Sanchez
Sec: Uno Lipisto
BLACKSTONE MINE, West Point,
undergr., Au, Ag, Pb
Gen Mgr: L A Sanchez
Gen Supt: E H Syme
50-TON FLOT MILL, at mine
Supt: Levi Lipisti

BLUE LIGHT SILVER MINES CO
Chapman Ranch, Fullerton
Pres: C Stanley Chapman
Sec: Sam L Collins
SILVERADO MINE, 29 mi E of
Orange in Silverado Canyon, Pb, Zn,
Ag
50-TON CONC & FLOT MILL, at
mine
Idle

BLUE RIDGE MIDWAY GOLD MINES CO, LTD
Callahan
Pres: Gerald B Hartley
Sec-Treas: S H Hartley
TIPTOP & HILTON CREEK MINES,
Mono Co., Wyo.
SUGAR HILL MINE, Callahan, Au
Idle
130 BLUE MINE, Callahan, Cu
Idle
PILOT MINE, Downsville, Au
Idle

BLUEBIRD MINE
P O Box 575, Winterhaven
Own: Robert K Foster
MINE, 3 mi NE of Ogilby
surface, mica
Gen Mgr: Robert K Foster
Prod: 5 tons
SIDEWINDER GRAY MILL, 7 mi W
of Winterhaven, water-wash mica
Prod: 5 tons mica

BLTYNE MANGANESE CO, INC
4845 W Olympic Blvd.,
Beverly Hills
Pres: Georges F Krenn
Sec: G Wolkenhauer
ARLINGTON GROUP, P O Box 325,
Blythe, undergr., & open pit, Mn
Prod: 350-355 tons
500-TON GRAY MILL, Inca Siding
Mill Supt: A F Garlick
(See Calrado Devel Co)

BON TON MINING CO
Murphy
BOWER LODGE MINE, East Belt
dist, Au, Ag
Idle

BRADFORD, L M
Box 207, Madera
DAULTON MINE, Daulton dist, Ag,
Cu, Pb
Idle

BRADLEY & ECKSTROM, INC
24 California St., San Francisco
Pres: E O Ekstrom
VP & Gen Mgr: R F Helms
MINES, Ariz, Calif, Nev, Utah,
Idaho, Ore, surface & undergr., Cu,
Fe, CaP₂, Mn, WO₃, rare earths,
asbestos
150-TON GRAY MILL, Castella
Supt: C Robinson
(See Ariz, Idaho)

BRADLEY MINING CO
640 Market St., Rm 513, San
Francisco 4
Pres: Worthen Bradley
Exec VP: John D Bradley
VP: James P Bradley
Sec-Treas: G C Orion
REED MINE, Lower Lake, Hg
(Lxard)
SULPHUR BANK MINE, Clearlake
Oakes, Hg
GREAT WESTERN MINE, Middle-
town, Hg
Idle
(See Idaho, Nevada)

BRIGGS, HARRY E
Box 613, Trona
RED CLOUD MINE, 10 mi E of
Ballarat, Panimint Mts, undergr.,
Au, Ag, Pb
Idle
SOUTHERN HOMESTAKE MINE,
8 mi S of Ballarat, undergr., Au, Ag
Idle

BRINK & NUHN
Box 2104, Stockton
YELLOW STAR MINE, West Point
Dist, Au

BROCK, ROBERT
River Pt, Box 23, Madera
HESKELL PROP, Madera Co., Au
Idle

BROWN, EUGENE B
O'Brien, Oregon
HIGH PLATEAU MINE, Del Norte
County, Cr

BROWN, JOSEPH OABEL
Camptonville
DEPOT HILL MINE, Yuba County,
placer, Au, Hydraulic and wash plant
Idle

BROWN BEAR MINES
Box 64, French Gulch
Gen Mgr & Consul Eng: E E Brich
**BROWN BEAR, TANGLE BLUE &
REID MINES**, 17 mi W of French
Gulch, Shasta County, undergr., Au
Idle
70-TON GRAY-FLOT MILL at
Brown Bear
30-TON GRAY-FLOT MILL at
Tangle Blue

BROWN'S CREEK PLACER
Box 23, Weaverville
GOLD PLACER, Trinity County
Idle

BROWNSTONE MNG CO, INC
Box 396, Bishop
Pres & Gen Mgr: W V Skinner
Treas: G B Voigt
BROWNSTONE MINE, Bishop, 30 mi
W of Bishop, undergr., scheelite
Idle
LAKE VIEW TALC PL, 2, 19 mi SE
Lone Pine, Si
Prod: 100 tons
(Leased from Gladding McBean Co)

BUCHENAU, H J
Box 8, Box 17, Madera
JESSIE BELL MINE, 15 mi NE of
Madera, undergr., Cu, Au, Ag
Under devel
Prod: 26 tons
Mine Supt: Bud Syme
30-TON FLOT MILL, Garfield, Utah
Mill Supt: Pete Rosetti

BUCKMAN LABORATORIES, INC, MNG DIV
Geyser Road, Cloverdale
Pres & Gen Mgr: Dr S J Buckman
VP: W D Still
Sec-Treas: C H Turner
Purch Agt: M Blakeslee
BUCKMAN MINES, undergr., open
pit, Hg
Gen Mgr: Roger H Miller
Gen Supt: Harold D Field
Frm: A E Turpin
80-TON MILL, at mine

BUENA VISTA MINE
Box 233, Templeton
Own: Harold J Biagini
BUENA VISTA MINE, Adelaide Rd,
17 mi W of Paso Robles, open pit, Hg
Mine Supt: Rudolph Rude
Prod: 115 tons
30-TON MILL at mine
Mill Supt: Errol Dodd
Asst Mill Supt: Dee Fitzhugh

BUENA VISTA NO 2 MINE
Box 25, Redding
Own: H G Graves
MINE, 3 mi W of Redding, Au, Cu,
WO₃, U₃O₈
20-TON FLOT MILL
Idle

BUNKER HILL CO, THE
The Bunker Hill Bldg, 640 Market
St., San Francisco 4
Pres: John D Bradley
VP: Emmett G Solomon, W G Woolf,
D L Feathers, R H Celling,
H E Lee
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: Gil Mayes, Kellogg, Idaho
(See Idaho, Wash)

BUNKER HILL MNG CO
Box 1347, Redding
Mgr & Eng: A Mansfield
BUNKER HILL MINE, 3 mi NW of
Redding, undergr. & surface, Au, Ag,
Cu
Mine Eng: Abraham Mansfield
Idle
SMELTER, 1-1/2 mi NW of Redding
Idle

BURGEN & OLSON MNG CO
P O Box 83, 839 Washington St.,
Hollister
STATTON & NORTH STAR CLAIMS,
Merced County, Hg

BURNS & SMITH COMS MINES
Box 15, Tecopa
Pres: Bob Burns
VP: Hugh Smith
Sec: R C Hall
BAGDAD CHASE MINE, Ludlow,
undergr., Au, Cu
Idle
SMELTER,

BURRO SHOE MNG CO, INC
2033 Baylor St., Duarte
Pres: Audley L Smith
VP: Cash L Swinney
Sec-Treas: Wm J Clark
BURRO SHOE MINE, Saline Valley
dist, open pit, Cu, Mn, Au, Ag
Under devel

BURTON MINES, INC
Ressamond
Pres & Gen Mgr: C G Burton
Purch Agt: George McNamee
TROPICO MINE, 5 mi W of Ressamond,
undergr., Au, Ag
Asst Mgr: G A Settle
Idle
300-TON CYANIDE MILL, at mine
Frm: Alec Burton
Assay: Frank Stemmone
SMELTER, at mill
Prod: 1,000 lbs yearly

BUTLER MNG & DEVEL CO, INC
1844 Zinfandel Drive, Box 28,
Rancho Cordova
SUGAR LOAF MINE, El Dorado
County, Au
Idle

BUTTE LODGE MNG CO
Box 195, Randsburg
Pres: Bert Wegman
BUTTE LODGE MINE, Kern County,
undergr., Au, Ag
CUSTOM MILL

BUTTE BAR MINES
Box 123, Plumas Co
Pres: Perry L Jones
BUTTE BAR MINE, Plumas Co,
undergr., Au, Ag, U₃O₈, Th, Se
Under devel
25-TON GRAY MILL
Under devel

BUTTE MINES
3315 La Cresta Dr., Bakersfield
Own & Op: J B Huston
BUTTE-MINE, 12 mi E of Glennville,
undergr. & surface, WO₃
Geol: Chas Shaw
MILL, at Glennville

C A M LEASING CO
Iowa Hill
OCCIDENTAL MINE, Placer County,
Au
Idle

C M S STRATEGIC METALS, INC
4000 SE Foster Rd., Portland 6
CLADMS, Del Norte Co., Mn
Idle

CACHUMA MNG CO
P O Box 94, Santa Ynez
CORRALES MINE, Santa Barbara
County, Cr₂O₃

CALARI MNG CO
2939 Linden, Long Beach 7
Pres & Gen Mgr: L F Albrecht
Sec-Treas: C M Smith
Gen Supt: V H LeMay
(See Ariz)

CALAVERAS CENTRAL GOLD MNG CO, LTD
Angels Camp
Pres & Gen Mgr: Harry Soars
Mgr: Desmond Soars
MINE, undergr., placer, Au
CRUSHING & SCRUBBING PLANT,
Au, Highway aggregates
Prod: 600-800 tons

CALIFORNIA INDUSTRIAL MINERALS CO
Box 180, Friant
Own: Forrest S Taylor
TAYLOR MINE, nr Friant, volcanic
ash
150-TON DRY MILL

CALIFORNIA LIMESTONE PRODUCTS
Box 1064, Blythe
Pres & Mgr: R S Hall
VP: John Soovajian
Sec-Treas: Maurice Willows, Jr.
LANGDON MINE, Box 1064, Blythe,
22 mi NW of Blythe, undergr. &
surface, Mn
Gen Mgr: R S Hall
Gen Supt: James F Carr
Prod: 300 tons of Mill grade ore

CALIFORNIA PLACER MINE
Sailor Flats
Own: Marie & Morton S Martin,
150 Arlington Ave., Berkeley 7
Gen Mgr: H T Martin
Geol: Chas S Haley
CALIFORNIA PLACER, 24 mi E of
Forest Hill on Forest Hill divide,
hydraulic, Au
Mine Supt: M S Martin
Idle

CALIF QUICKSILVER MINES, INC
215 Market St., San Francisco 5
Pres: R F O'Bryan
VP: R F Hasenauer
Sec: H H Hill
ABBOTT MINE, Box 548, Williams,
undergr., Hg
Gen Mgr: C O Reed
Geol: Fred Hanson
Frm: A J White
Prod: 50 tons
60-TON GRAY MILL at mine, rotary
tile

CALRADO DEVEL CO
Box 1064, Blythe
Co-Part: R S Hall & Maurice
Willows, Jr

BLACK JACK-ARLINGTON MANGANESE MINE, 22 mi NW of
Blythe, surface & undergr.
(Leased to Blythe Manganese Co)

CAMPION, IVAN H
Somerset via Coles Station
BREX SLIDE MINE, 33 mi SE of
Placerville, undergr., placer, Au,
Ag
Idle

CARRADINO, INC
1027 W 18th St., Santa Ana
Pres: R H Carr
VP: M W Carr
Sec: Daisy Rigdon
JUPITER MINE, San Bernardino
Co., undergr., Pb
Geol: Donald Carlson

CARRILLO, JUAN H
Bitterwater Rd., King City
SANTA MARGARITA MINE, New
Iberia Dist., San Benito Co., surface,
Hg

CASTELLA MNG & MLO CO
24 California St., San Francisco 11
LAMBERT MINE, Butte Co., Cr₂O₃

CASTLE, E C
Box 138, Bishop
WHITE CAPS MINE, Inyo Co., WO₃
Idle

CASTRO MNG CO
1819 San Luis Dr., San Luis Obispo
Gen Part: D A Hall, Geo I Barnett
CASTRO CHROME MINE, a

CASTRO MNG CO
1819 San Luis Dr., San Luis Obispo
Gen Part: D A Hall, Geo I Barnett
CASTRO CHROME MINE, open pit,
Cr
Prod: 75 tons
CONCEN, San Luis Obispo

CEM TUNGSTON MNG CO
Box 415, Fresno
Pres: Charles E Marsh II
SWAMP LAKE MINE, Dickey Creek,
undergr., scheelite
Mgr & Geol: Neil B Steuer
Supt: Lloyd Gilbert
Idle
50-TON GRAY MILL, Grouse Lake

CHALLENGE MNG CO
727 Shasta St., Redwood City
CHALLENGE MINE, San Mateo
County, Hg

CHAMBERLIN, CHARLES
Box 24, Johannesburg
OR GROUP, Kern County, undergr.,
Au
Idle

CHAPMAN & SONS

Junction City
CHAPMAN & FISHER PLACERS,
Trinity County, hydraulics, Au
Supt: G P Chapman
Idle

CHLORIDE CLIFFS MINE

Beatty Nev
MINE, Inyo County, undergr, Au, Pb
Idle

CHOWCHILLA DREDGE CO

Box 348, Whittier
CHOWCHILLA MINE, Madera Cty,
placer, dredge, Au
Idle

CITY BLUE GRAVEL MINE

Box 206, Redding
Off: H O Hampton, R H Cochran,
Donald Playlinsen

MINE, 1 mi W of Redding, undergr,
Au

15-TON FLOT MILL

Idle

CLARK, CHARLES A

P O Box 41, El Dorado
OPHIR LODGE, Mother Lode dist,
Au, Ag
Idle

CLARK BROS

Star Rt, Box 32B, Folsom
PINE KNOLL MINE, West Belt dist,
Au, Ag
Idle

COLLINS, T E & BLOSS,

STEPHEN
Rt 1, Box 64, Central Pt, Ore
BLUE JAY MINE, Siskiyou Cty, Cr
(See Oregon)

COLUMBIA - SOUTHERN

CHEM CORP - (Subsidiary of)
PITTSBURGH PLATE GLASS
CO)

81, Gateway Center, Pittsburgh 22,
Pennsylvania

PLANT, Bartlett, Owens Lake dist,
borax

Plant Supt: Carl P Boudie
Idle

COLUMBUS MINE

Box 164, Bell Gardens
Own: Grace D Ball & Henry W Wimmer
(See Wyoming)

COMSTOCK QUICKSILVER

CO, LTD
537 California St, San Francisco
CLOVERDALE MINE, Sonoma Cty,
Hg
Idle

CONSOL MANGANESE CORP

300 Montgomery St, San Francisco
MINE, Sonoma County, Mn
Idle

CONTINI BROS

Box 183, Jackson
Pres & Gen Mgr: Nick Contini
VP & Asst Gen Mgr: Bert Contini
CONTINI THREE HORSEMEN, DEL
MINES, 7 1/4 mi E of Jackson on
Hwy 88, undergr, Au, Ag
Idle

STAMP MILL, Irish Town

Mill Supt: V Garbajal

Assay: Marc Hanna
Idle

E B COOK CO

1063 Howard St, San Francisco 3
PERMIT MINE, Mariposa Cty,
undergr, Au
Idle

8-TON MILL

Supt: H H Odgers

COPPER QUEEN MNG CO

c/o Miles W Edgill, President

131 "T" St, Sacramento

COPPER QUEEN GROUP LODGE,
Sawpit Flat dist, Cu, Au, Ag
Idle

CORDERO MINING CO

131 University Ave, Palo Alto
VP: S H Williston
Gen Mgr: J Eldon Gilbert
MAY LUNDY MINE, Mono, 10 mi W
of Mono Lake, Au
Idle

QUEEN SAGE MINE, Hollister, 10 mi
E of Hollister, undergr, Sb
Idle

Gen Supt: Herbert Mitchell

(See Idaho, Nevada, Oregon)

CORONADO COPPER & ZINC

CO
833 W 6th St, Los Angeles 14
Pres: Geo D Dub
VP: H T Mudd
(See Arizona)

CRAIG, MRS C M

2457 Portola Way, Sacramento
PERKINS GRAVEL CO PLANT
American River dist, placer, Au, Ag
HAOGIN GRAVEL PITS &
DEL PASO GRAVEL PITS,
Folsom dist

CROTSBERG, S D

Kernville
BRUSH CREEK MINE, Kern Cty,
WO
Idle

CRUMPTON, VICTOR

Happy Camp
MINE, Siskiyou County, Au, Ag
Idle

CRYSTAL BALL MNG CO

21880 Bortram Rd, San Jose
MINE, Santa Clara Cty, undergr &
open pit, Hg
Gen Mgr: Woodrow Goodman
Gen Supt: Frank U Thompson
Geol: Jack Whittaker
Mech Eng: Arthur Morril
Prod: 14 tons
MILL & REFINERY, at mine
Mill Supt: Wm Duarte
Prod: 17, 268 lbs Mercury annually

CUMMINGS - ROBERTS

739 N Highland Ave,
Los Angeles 38
Gen Part: H Evan Roberts
(See Mont)

CYCLONE GAP MINE

Box 475, Grants Pass, Ore
Leases: Wm S & Ruth Robertson
& Assoc
MINE, Siskiyou Cty, 30 mi S of
O'Brien, Ore, undergr, Cr
Mine Supt: W S Robertson
Asst Mine Supt: A E Ekstrand
Prod: 10 tons daily
Idle

CYPRUS MINES CORP

1206 Pacific Mutual Bldg, Los
Angeles 14
Pres: H T Mudd
VP: A R Thomas
VP & Treas: H S Nye
Sec: L A Garrett
Purch Agt: W F Stover
(See Ariz, Colo)

D & D MLO CO

1106 W Isabel St, Burbank
RED ROCK MINE, Inyo County,
WO
Idle

DHYO GROUP, Inyo County, Au**DAKIN CO**

2811 Hillside Dr, Burlingame
Pres: Fred H Dakin
VP: Wesley W Kergan
Sec: Henrietta Dakin
UNCLE SAM MINE, 10 mi NW of
Central City, Shasta Cty, undergr,
Au, Cu, Zn, Ag
Idle

DAVIES, TOM

Caliente
JUAN DOSE MINE, Kern County,
undergr, Au, Ag
MINNIE ELLEN MINE, Tulare Cty
P & D LODGE, Agua Caliente dist,
Ag, Au
Idle

DAVIS MNG CO

Rt 1, Box 158, Santa Maria
DAVIS MILL, Santa Barbara Cty,
Cr₂O₃

DAVIS, CLIFTON F

Box 32, Greenwood
C B DAVIS PROP (McGRUBB) LODGE,
Mother Lode dist, Au, Ag
Idle

DAVIS, RICHARD D

1144 11th St, San Bernardino
COPPER CRYSTAL LODGE, State
Range dist, Pb, Ag, Cu, Zn
Idle

DAVIS, ROBERT E

Rt 2, Box 3685, Sacramento
BRIGHTON SAND & GRAVEL PLANT,
Folsom dist, Au, Ag

DAVIS, W O

1848 103rd Ave, Oakland
REDCAP GROUP, Orleans dist,
placer, Au, Ag
Idle

DEATH VALLEY PANAMINT

MNG CO
Box 134, Baker
Pres: Ellis O Baker
TELEGRAPH MINE, Inyo Cty, Au
Idle

DELL OSSO GOLD MNG CO

Box 3435, Terminal Annex,
Los Angeles 54
DELL OSSO LODGE, Talvord mng
dist, Au, Ag, lime, garnets & silica
Idle

DEL MONTE PROPERTIES

CO, SAND DIV
Box 150, Pacific Grove
Pres: S F B Morse
Plant Mgr: H H Bein
Sales Mgr: P C Valentine
Metal: Henry Banach
Gen Supt: C J Houseman
Geol: Don Tibbals
MINE, Del Monte Forest, Pebble
Beach, surface, glass sand, quartz,
feldspar, gr sand
Prod: 800 tons
800-TON FLOT MILL

DELTA MNG CO

1718 H St, Merced
Op: F S Herring
JESSE BELLE MINE, Madera Cty,
Cu

DIATOMIC CHEM PRODUCTS

CO, INC
1518 Industrial St, Los Angeles 21
Pres: Charles L Seymour
VP: Carmen Eposito
Sec-Treas: John F Atwill
DIATOMIC MINE, Hwy 1, Lompoc,
open pit, diatomite
Gen Supt: D R Stephens
Prod: 30 tons processed calcined
3,000-TON MILL, Lompoc

DICKEY EXPLOR CO

Allegheny
ORIENTAL LODGE MINE, undergr,
Au, Ag
Gen Mgr: Donald R Dickey
Geol: W Fuller
Mine Frm: Frank Knapp
75-TON FLOT-GRAV MILL, at mine
Assay: Abbot Hanks

DILTZ ORO GRANDE MNG CO

414 21st St, Merced
Op: J J Fulham
MINE, Mariposa Cty, Au
Idle

DOBBS, D A & ASSOC

1106 W Isabel St, Burbank
BRONZE MINE, San Bernardino
Co, WO₃
Idle

DONAHUE, LYLE

Oasis via Big Pine
TARGET GROUP LODGE & MILL,
Deep Springs dist, WO₃
Idle

DONNER, H L

Milton via Farmington
DONNER & LOST LOG MINES,
Calaveras Cty, Au
Idle

DOSCHER, CHARLES,

VISCIOVICH, V &
MILCOSEVICH, STEVE
Pine Grove
JUMBO LODGE, East Belt dist, Au,
Ag
Idle

DOUBLE O TIMBER & MNG

CO
300 Davis St, San Francisco 11
VP: Hans Hammer
Sec-Treas: Albert S Simrak
DOUBLE O MINE, 50 mi NE of
Auburn, placer, Au
Idle

DRY ORE CONCENTRATOR,

INC
Box 742, Yreka
Pres: A Dugster
VP: Carroll Birdwell
VP & Gen Mgr: Austin C Putnam
Sec-Treas: Max A Putnam
OSGOOD MINE, Siskiyou Cty,
Au, Ag, Pb, Pt, Cr, O₂, Mn
100-TON MILL, 1 mi W of Yreka
Under devel

EARLY MORNING MNG CO

1185 Monterey St, San Luis Obispo
EARLY MORNING MINE, Fresno
County, Cr
Idle

EAST RIDGE CO

633 Shatto Place, Los Angeles 6
Pres: C E Byrne
VP: F Moldenhauer
Sec: Alice Davenport
(See Colo)

EDGECLIFF EXPLOR CO

281 S Hudson, Pasadena 5
Pres: Mrs Charlotte Morgan
VP: C A Haley
Sec: Arnold Holden
Treas & Gen Mgr: G H Morgan
(See Alaska)

EL DORADO LIMESTONE CO

Shingle
Pres: J H Bell
VP: E O Schnetz
Gen Mgr: C R Nichols
Sec: H F Armes
Mech Eng: Paul Ransom
LIMESTONE MINE, 4 1/2 mi SW of
Shingle Springs, undergr, limestone
Mine Supt: F G De Barry
Prod: 600 tons
MILL, Crushing, Washing, Screening

EL DORADO - PLUMBAGO

MINES CONS, INC
211 Octavia St, San Francisco
Pres: Ernest G Heath
VP: Lewis C Adams
Sec-Treas: Richard H Wong
EL DORADO-PLUMBAGO MINE,
Sierra County, Au
Gen Mgr & Gen Supt: Roland P Degrie
Geol: Thomas H Taylor

ENGEL, RENE & ASSOC

P O Box 66, Wofford Heights
PALA, BIG RAYMOND, B & F,
LAST CHANCE MINES, Kernville &
Weldon dists, Kern County, undergr,
WO₃
Gen Mgr: Dr Rene Engel
Prod: 50 tons
50-TON GRAV MILL, Weldon
Idle

FAIR OAKS GRAVEL CO

4000 Illinois Ave, Fair Oaks
GRAVEL PLANT, Sacramento
County, Au

FAIRFIELD MNG CO, INC

831 E Main St, Stockton
Pres & Purch Agt: Ray A Washburn
VP: Ray Julius
Sec & Treas: F M Lucacchini
(See Idaho)

FAIRVIEW PLACERS

Lewiston
(Joint venture of Sunshine Mng Co &
The Idaho Canadian Dredging Co)
Own: Rep & Gen Mgr: H B Murphy
Purch Agt: A D Soule
PLACER, 10 mi N of Lewiston,
8,000 yd bucket dredge, Au, Ag
Supt: H C Young

FERNANDEZ, FRANK C

1326 Pine St, Santa Monica
Gen Mgr: George Greve
MONO PIUTE RAINBOW MINE, 10
mi NE of Bishop, undergr, surface,
Au, Ag, Pt
25-TON GRAV MILL, Piute Canyon
Idle
(See Sunday Mng Co, Nev)

FIREBOARD PAPER PRO-

DUCTS CORP
(PABCO BLDG MATLS DIV)
1789 Montgomery St,
San Francisco 11
Pres: W L Keady
VP: B P Altick, E W Fish,
R R Galloway, A S Halley,
J F Harward, O C Majors,
M E Sanford, W K Spence,
W H Young
Sec: J S Mitchell
Treas: V H Erickson
Gen Mgr: R R Galloway
(See Colo)

FIDELITY MINE

Columbia
Mgr: Wayne Stobough
MINE, Au, Ag
Supt: Vernon Ray
3-TON GRAV MILL
Idle

FIDELITY MNG CORP.
10635 Harard Ave, Inglewood 2
Own & Pres: L Mills Beam
TEMPLE MOUNTAIN MINE, undergr,
U₃O₈

FIFE, E J & E M
Star Rt, Box 728, Lucerne Valley
BUCKHORN LODGE, SW of Lucerne
Valley, surface, Au, Ag
Idle
HIGH POINT LODGE, NE of Lucerne
Valley, undergr, Au, Ag
Idle

FILLIER, EARL J
Coarse Gold, Madera County
GOLDEN RIBBON, TEXAS FLAT,
& KLICKITY KLICK GROUP LODES,
1 mi N of Coarse Gold, undergr, Au
Idle

**FITZGERALD, SMITH &
ASSOC**
Box 586, Placerville
COPPER HILL MINE, Amador
County, Ca
Idle

**FITZHUUGH & OSBORN
MNG CO**
P O Box 308, Templeton
LA LIBERTAD MINE, San Luis
Obispo County, Hg

**FOOD MACHINERY AND
CHEMICAL CORP, WESTVACO
MIN PROD DIV**
Box 337, Newark
Gen Mgr: R F Moran
Asst to Gen Mgr: D C Linton
Oper Supt: S M Cimino
WESTVACO MINE, Box 981, Hollister,
surface, dolomite
Prod: 350 tons
Mine Supt: R Swindleshurst
500-TON MILL, Hollister
Mill Supt: R Swindleshurst
Assay: Norman Cunha
(See N Mex)

FOREMAN & FOREMAN
Box 178, Darwin
Pres: L D Foreman
Gen Mgr: R L Foreman
DEFENSE MINE, 11 mi S of Panamint
Springs, undergr, Pb, Ag
Idle

FOREST MINES, INC
Forest
Pres: Cecil T Vivian
Sec-Treas: Virginia A Vivian
Gen Mgr: Cecil T Vivian
NORTH FORK MINE, Sierra City, Au
Starting oper in 1988

FRIDAY NICKEL SYNDICATE
3105 Wilshire Blvd, Los Angeles 5
Pres: D B MacAfee
VP: Dudley Cornell
Sec: Saul J Hernandez
Treas: Marvin L Tragerman
Tech Dir: M W MacAfee
FRIDAY NICKEL MINE, Julian,
undergr, Ni, Co, S
Under devel

FRYE, HERVEY V
c/o Isokip Inn, Stirling City
MONEY MUSK MINE, Butte County,
open pit, placer, Au
Idle

GAMBLE, GEORGE
1431 Waverly St, Palo Alto
KNOWVILLE MINE, Napa County, Hg
Idle

GARCIA, MARINO & KINSELA
Midtown
JAMES CREEK PLACER, Napa
County, Hg

GARIBALDI BROS
Volcano
GARIBALDI MINE, Amador Cty, Au
Idle

GARNET DIKE MINE
King River Hatchery, Fresno
MINE, Fresno Cty, WO₃
Idle

GENERAL DREDGING CO
Maloma
Part: Giddings, Haines & Boucher
PLACER, 2 mi from Poisson, drag-
line, Au, Ag
Idle

GENERAL DREDGE #1, American
Riv Dist, placer, Au, Ag, Pb
Idle

GENERAL MNG CORP
8272 Sunset Blvd, Los Angeles
Pres: E J Speake
VP: Don Carly
Sec: Allan Thody
Treas: Howard Mallring
(See Ariz)

GHEZZI & HARRY
158 Tunstead Ave, San Anselmo
LAZAR LODGE, Mother Lode dist, Au
Idle

GIBRALTER MNG CO
1518 Lakewood Blvd, Paramount
GIBRALTER GROUP, Santa Barbara
County, Hg

GILES BROS
Frederick H & Daniel A Giles,
Alhambra
GENERAL SHERMAN, SPOOLIN
LODES
Idle
GOLD CROWN LODGE
(See Gold Crown Mng Corp)

GILES, JOSEPH P
11371 S Steiling Rd, Cupertino
HUMMINGBIRD MINE, Shasta Cty,
near Redding, undergr, Au
GRAY-AMAL MILL, at mine

GIPSY MINE & MILL CO
11115 Wicks, San Valley
Pres & Gen Mgr: J H Bennett
Sec-Treas: A E Bennett
MINE, San Valley, open pit,
WO₃, Au, Ag
Under devel
80-TON FLOT-GRAY MILL, Babers-
field

GLADDING, McBEAN & CO
2901 Los Felis Blvd, Los Angeles,
38
Pres: C W Planje
Sec: R A Eccles
Treas: E M Dundas
PLANTS, Corona, Inne, Lincoln,
Pittsburgh, South Gate, Los Angeles
MINES, Amador, Inyo, Kern, Los
Angeles, Orange, Placer, Riverside,
San Bernardino & Yuba Cys
(See Washington)

GLENN CO
703 37th Ave, Oakland 1
Own & Gen Mgr: George G Glenn
Gen Supt: Harry Odgers
MARBLE SPRINGS MINE, 12 mi E
of Coulterville, undergr, Au, Ag, Pb
56-TON FLOT MILL
Mill Supt: Frank Lane
Idle

GLIDDEN CO, THE
Box 430, Redding
Pres: Dwight P Joyce
Sec: R D Horner
BULLY HILL & RISING STAR MINES,
Shasta County, undergr, Co, Zn, Au,
Ag
Idle

GOLD HILL DREDGING CO
311 California St, San Francisco 4
Pres: J J Coney
Asst Sec: H S Gilbert
Asst Treas: C A Ames
Purch Agt: E O Perkins
PLACER PROP on Mokelumne Riv
in San Joaquin Cty, Feather Riv
in Butte County bucketline, Au, Ag
Supt: H L Coney
Idle

GOLDEN DEAR MINE
495 N Bowling Green, Los Angeles,
49
Pres: Ervin J Dear
MINE, Ord Mts, 15 mi N of Lodi, undergr,
surface, U₃O₈, Th, Ag, Au
Under devel

GONZALES, PAUL
1499 Ford Ave, San Jose
WONDER MINE, San Benito Cty, Hg
Under devel

GOOD HOPE MNG CO
120 "O" St, Fresno
Pres & Gen Mgr: J H Loughhead
MINE, 30 mi E of Visalia, undergr,
WO₃
Gen Supt: R Johnson
Prod: 50 tons
80-TON GRAY MILL
Mill Supt: R Johnson
Idle

GOODHUE, J W
Taylorsville
PILOT MINE, Genesee, Plumas
County, surface, undergr, Au, Ag,
Cu
Under devel

GOSAM CAP MINE
Box 396, Inyokern
Pres: Mrs Ralph Griffen
VP: Mrs C W Wheeler
Gen Mgr: C W Wheeler
Gen Supt: R W Griffen
Elec Eng: Ed Kamper
GOSAM CAP MINE, 1 1/3 mi from
summit of Walker Pass, Chalcopyrite,
Cu, Au, Ag, V₂O₅
35-TON-FLOT-GRAY MILL, at mine
Idle

GOULD, H W & CO
708 Union St, San Francisco
Own: Malcolm B Gould
HELEN MINE, 6 mi SW of Middletown,
Lake County, Hg
Under devel
(See Kiss Mine, Inc)

GRANTHAM MINES
237 N 2nd Ave, Upland
Pres: Louise Grantham
WARM SPRINGS TALC DEPOSIT,
Inyo County, Talc
BIG TALC, 48 mi NW of Shoshone,
Talc
Mine Supt: John Odgers
Mine Frm: Tom Nardman
Mine Engr: R H Franklin

**GREAT LAKES CARBON CORP
MNG & MINERAL PROD DIV
DICALITE DEPARTMENT**
515 S Flower St, Los Angeles 17
Pres: George Babak, Jr
VP & Gen Mgr: D L Mariett
Op Mgr: E A Harris
Asst Op Mgr: N V Brower
Purch Agt: Jay Hughes
PLANT #1 (RADAR HILL MINE),
Box 107, Watteria, open pit, diato-
maceous silica
MILL, Watteria
Supt: A K Muir
Asst Supt: Carl F Schnohls
Frm: Orval Chance
Ch Chem: E L Neu
Ch Eng: D F Dyrmaid
PLANT #5, Box C, Lompoc, 7 mi
W of Lompoc, surface, diatomite
MILL, Lompoc
Mill Supt: E D Ingram
Asst Supt: R W Yocum
Frm: Martin Oryczko & John
Bradford
Ch Chem: J W Girard
(See Gr Lakes Carbon Corp, Colo,
Nev, N Mex, Oreg)

**GREAT LAKES OIL &
CHEMICAL CO**
417 S Hill St, Los Angeles 13
Pres: Charles S Hale
Sec: Richard E Bishop
Treas: John R Atkins
KEROON MINE, Miracle Hot Springs,
undergr, U₃O₈
Under devel

GREEN, SHERWOOD
219 S "D" St, Madera
ACE PLACER, Madera County, Au
JENSEN PLACER, Friant dist, Au
Idle

**HAMPTON MNG CO, CHROME
DIV (Subsid of CONSOL
VIRGINIA MNG CO, Nevada)**
274 S Lafayette Park Place,
Los Angeles
Treas: T E Wilson
SAWMILL CREEK MINE, San Benito
County, open pit
Gen Mgr: Joseph R Holman
Gen Supt: Jack M James
Prod: 50 tons
100-TON MILL
Mill Frm: Don Sking

HARRIS, MICHAEL
c/o Furnace Creek Ranch,
Death Valley
KEANE WONDER EXTENSION LODGE,
Chloride Cliff dist, Au, Ag
Idle

HAZEL CREEK MNG CORP
Box 3508, North Sacramento
Pres, Gen Mgr & Purch Agt:
Richard Roms
VP: J Dickson Smith
Sec-Treas: Edwin Wilder
HAZEL CREEK MINE, Box 267,
Pollock Pines, 6 mi SE of Pollock

Pines, undergr, Au, Ag, Pb, Zn
Mine Supt: John Cooney
Asst Supt: Martin Humbird
Elec Eng: Carl Weyel
Prod: 50-100 tons
FLOT-MILL, Hazel Valley
SMELTER, Selby

HEATHER, HARRY P
236 S Oak Knoll Ave, Pasadena
BRIGHT OUTLOOK MINE, San
Bernardino Cty, Cu, Pb
6 DAUGHTERS, Needles, undergr,
U₃O₈, bentonite
OVERSITE MINE, Amboy, open pit,
summit
Idle
(See Ariz)

**HELMKE, THOMAS &
JANSSEN**
24 California St, San Francisco
LAMBERT, LITTLE CASTLE CREEK,
COSTA, CROW CREEK, FOREST
QUEEN MINES, undergr & open pit,
Cr
Gen Mgr: O A Fulgham
Mine Supt: Veri Price
Mine Frm: C A Barton
150-TON GRAY MILL, Castella
Mill Supt: C R Robinson

HERBERT, O A
Box 87, Plymouth
WOLIN PROPERTY, Mother Lode
dist, placer, Au
Idle

HERBERT MINES
Rt 5, Box 136A, Porterville
TUNOSTEN MINE, Tulare Cty, WO₃
Idle

HIGH NOON MINE
Furnace Creek Ranch
Op: Ralph S Dahl
MINE, Wildrose dist, undergr &
surface, scheelite
Idle

HILLEN HOLDING MNG CORP
1350 N Lemon, Menlo Park
Pres: Wm C Holding
VP: P C Hillen
Sec: Keith Petty
Treas: Keith Garner
SONORA URANIUM MINE, Mono
Cty, undergr, open pit, U₃O₈
Gen Mgr: W C Holding
Supt: P C Hillen
Prod: 20 tons

HILLTOP TUNOSTEN MINE
Sanger, c/o E G Peron, Trimmer
Rt, Maxon's Store
MINE, 18 mi E of Trimmer, undergr,
WO₃
Idle

HOFFMAN, JOHN D
788 Marsh St, San Luis Obispo
NORCROSS & SWEETWATER MINES,
San Luis Obispo Cty, open pit, Cr
150-TON GRAVITY MILL

**HOLDING MINE & DEVEL
CO**
19 Campo Bello, Menlo Park
Pres: Wm C Holding
VP & Gen Mgr: P C Hillen
BROOKSTING TUNOSTEN MINE,
Mono Cty, Tioga Pass near Lee
Vining Canyon, undergr, WO₃, Mo
Idle

HOLMAN, J R
1465 E Orange Grove Ave,
Pasadena 7
BONELL STATE LEASE, Coalinga,
open pit, Cr
Gen Mgr: J R Holman
Asst Gen Mgr: B A Pimhott
Supt: Richard Wilder
Prod: 30 tons
MISTAKE MINE, 30 mi W of
Coalinga, open pit, Cr
Idle
40-TON GRAY MILL, White Cr
Supt: F W Wilder, Jr

HOLMESTAKE MNG CO
Box 308, Winterhaven
Pres & Gen Mgr: K A Holmes
Asst Gen Mgr: Leo Hardy
CARGO MUCHACHO GROUP,
Imperial Co
CASTLE DOME FLUORSPAR,
Imperial Co
125-TON FLOT MILL, 4 mi W of
Winterhaven
Mill Supt: James G Hardy
Assay: Harvey Hardy
(See Arizona)

HOMESTAKE MNG CO
100 Bush St, San Francisco
Pres: Donald H McLaughlin
VP: A H Shoemaker
VP: James W Sweet
Sec-Treas: John W Hamilton
Gen Mgr: J O Harder
(See So Dak, Utah, Wyo)

HOPE SO MINE
c/o R W Leslie, 2118 Eureka
Way, Redding
MINE, undergr, Au, WO₃
Gen Mgr: R W Leslie
Kills
25-TON JIG MILL

**HUNTLEY INDUSTRIAL
MINERALS INC**
Box 305, Bishop
Pres: W H Huntley
VP: D T Davis
Sec-Treas: Cecile M Huntley
COLTON MINE,

**HUNTLEY INDUSTRIAL
MINERALS INC**
Box 305, Bishop
Pres: W H Huntley
VP: D T Davis
Sec-Treas: Cecile M Huntley
COLTON MINE, 30 mi NE of Bishop,
open pit, pyrophyllite
LAWRENCE MINE, 5 mi S of Tia
Mountain in Utebebe Range, open
pit asbestos
PACIFIC PYROPHYLLITE MINE,
20 mi N of Laws, open pit,
pyrophyllite
TUNGSTEN CITY TUNGSTEN MINE
7 mi W of Bishop, open pit &
undergr, WO₃
HUNTLEY TALC MINE, 43 mi SE
of Big Pine, undergr & open pit,
talc
Prod: 35 tons

LITTLE ANTELOPE CLAY MINE,
Hot Creek, Mono Cty, open pit,
White Kaolin Clay
Mine Supt: D T Davis
Prod: 250 tons

HUNTLEY NON-METALLIC MILLS
Laws, talc, pyrophyllite, mica
feldspar, clays
Prod: 6,000 tons per month
(See Ariz)

**IDAHO MARYLAND MINES
CORP**
Box 1028, Grass Valley
Pres & Gen Mgr: Bert C Austin
VP & Asst Gen Mgr: Max Beckhold
Sec-Treas: C L Allan
BRUNSWICK MINE, 2 1/2 mi NW of
Grass Valley, undergr, WO₃, Au, Ag
Prod: 40 tons WO₃, 30 tons Au
750-TON GLOT MILL, Grass Valley
Mill Frm: Oliver Peterson
Idle
(See Utah)

IGO MINING CO
Box 1412, Redding
Pres: R B Tupper
Gen Mgr: M E Howe
MEX WYKE MINE, Igo, Au, Ag,
Pb, Zn
YANKEEJOHN MINE, Au, Ag, Pb
Idle

**INDUSTRIAL MINERALS &
CHEMICAL CO**
8th and Glisan Sts, Berkeley 10
Pres: L R Moretti
VP: W S Cowgill
Sec-Treas: A L Forbes
SPANISH MINE, Nevada Cty, barite
Idle
MILLS, Berkeley and Florin, non-
metallic
Mill Supt: Forrest Rhoton
(See Nev)

INYO MARBLE CO
4708 N Muscatel Ave, Rosemead
(Exec office); 728-732 E 39th St,
Los Angeles 11
Pres & Treas: D H Dunn
VP: L R Glover
Sec: C A Craven
CONSOLID INYO PROPERTIES
Dolomite via Lone Pine, surface,
marble, limestone, dolomite,
quartzite
Gen Mgr: D Haven Dunn
(Quartzite properties leased to
Gladding, McBean & Co and General
Refractories)
(Marble & dolomite leased to Lone
Pine Company)

INYO SOIL SULPHUR CO
310 Pacific St, Bakersfield
CRATER CLAIMS, Inyo County, S
Idle

IRELAN YUBA CO, LTD
1921 Stockton Blvd, Sacramento
IRELAN MINE, Sierra County, Ag
Idle

J & W MINING CO
Corvallis, Oreg
Pres: Norman Johnson
Sec-Treas: Chas S Wilson
TYSON CHROME MINE, Gasquet
20 mi NE of Crescent City, undergr,
surface, Cr
Supt: William Whippo
Cons Eng: K O Watkins

JANETT, E F
11894 Sheldon Ave, San Valley
AURORA MINE, New Idria Dist,
San Benito Cty, surface, Hg

JANZEN, PETER
Gasquet
CHROME HILL, ELK CAMP,
Patrick's Cr, Butte Cty, Cr

**JOHNS-MANVILLE PRODUCTS
CORP**
Lompoc
Plant Mgr: O B Westmont
Asst Mgr: G G Schuchnecht
MINE, Lompoc, surface,
diatomaceous silica
Quarry & Mines Supt: C W Sphar
Asst Supt: E W Hodges
Gen Frm: O C Benedict
Eng: D E Neuschwander
Mine Supt: C W Sphar
Main Mine Supt: E W Hodges
MILL, at mine
Mill Supt: G W Porter
(See NY)

WALTER W JOHNSON CO
141 Battery St, San Francisco
(See Brinker-Johnson Co, Alaska)

JOLLY JACK URANIUM CO
2550 - 28 Ave, San Francisco 16
Pres: Richard H Hall
VP: Vernon R Aiken
Sec Treas: Stanley S Dunnaway
(See Utah)

JOUBERT PLACER MINE
Sawyers Bar
Own: Louis J Joubert
HYDRAULIC PLACER, Au, Ag
(Leased by Strawacker & Hartnett)
Idle

JUDGE HYDRAULIC MINE
Sawyers Bar
PLACER, Siskiyou Cty, Au
Idle

K P F & F MNG CO
Box 1, Igo
TROUT CREEK, BARRY CREEK,
BLACK BEAR, LUCKY SUNDAY
MINES, Trinity County, Mn
Idle

**KAISER ALUMINUM & CHEM
CORP**
1924 Broadway, Oakland 12
Pres: Henry J Kaiser
VP: D A Rhodes
Sec: Wm Marks
Treas: R A Clayton
Purch Agt: Duncan Gregg
Mgr: Chem Div: F M Cashin
Geol: E A Hansen
NATIVIDAD PLANT, Box 1531,
Salinas
Works Mgr: J F Knight
Gen Supt: D M Kerr
Asst to Mgr: Wm Burns
Plant Supt: Ivan Hall
Mech Eng: J E Winter
HEAVY-MED MILL, Natividad

KAISER STEEL CORP
1924 Broadway, Oakland 12
Pres & Chmn of Bd: Henry J Kaiser
VP & Gen Mgr: Jack L Ashby
VP & Sec: William Marks
VP & Treas: Atwood Austin
Gen Purch Agt: G W Kelly
EAGLE MOUNTAIN MINE, Box 158,
Eagle Mountain, surface, Fe
Mine Mgr: Martin J Hughes
Mine Geol: R W Brummert
Mine Frm: W A Horton
Mine Eng: C E Davis
Master Mech: C A Scott, Jr
15,000-TON MILL, at mine, heavy
media & jigging
Mill Supt: C W Reno
Benefic Plant Frm: R F Wentzell

**Night Shift Benefic Frm: J D Hill,
J J Statler**
BLAST FURNACE, 1,314,000-ton
capacity, Fontana
Iron & Steel Div Supt: J D Saussaman
Supt, Blast Furnace: R B Newmeyer
Works Mgr: B N Dagan

KEANE EXTENSION MNG CO
Box 224, Beatty, Nev
Own: Michael & James Harris
MINE, Death Valley, Inyo County,
undergr, Au, Pb, Fe, Ag
Idle

KELLY, T C
Hayfork
KELLY MINE, 5 mi NE of Hayfork,
undergr, Au, Ag
Idle

**KENNEDY MINERALS CO
INC**
2550 E Olympic Blvd, Los
Angeles 25
Pres: John J Kennedy
VP: A F Escobar
Sec: Paul H Wayne
Treas: Fred L Clover
ECLIPSE, Inyo County
TALC AND DEATH VALLEY, Inyo
County

KERSON MNG CO
215 Naylor, Taft
Own: Jack I Kerns
W T Waggoner
KERSON MINE, Box 8, Star Rt,
Kernville, undergr, U₃O₈
(Oper by Great Lakes Oil & Cham Co)

KERN COUNTY LAND CO
400 California St, San Francisco
Pres: George Montgomery
VP, Oil & Minerals: H L Reid
Chief Geol: Wm Griswold
Explor
(See Utah)

KERN URANIUM CO
P O Box 161, Rio Vista
Pres & Gen Mgr: Lloyd Scouler
VP: J H Baumann
Sec: S W Gardiner
LITTLE SPARKLER #4, Box 1048,
Isabella, undergr, U₃O₈
Geol: Allen B Scouler
Mine Supt: Vern Harrington
Mine Frm: William Moreland
Cons Eng: L V Ivanhoe
Prod: 7 tons

KEYSTONE COPPER CORP
Box 7, Nevada City
MINE, Nevada City, Au, Ag
Idle

KEYSTONE MINE
Agent: H G O'Hanlon for Martin
Ares, Sutter Creek
KEYSTONE LOIDE, Mother Lode
dist, Au, Ag, Cu
Idle

KIMBROUGH, WILLIE A
2804 Compton Ave, Los Angeles 2
SUNRISE #1, #2, #3 & LUCKY
BILLIE CLAIMS #1, #2, #3, #4,
Oro Grande mng dist, San Bernar-
dino County, Au, Ag, Se, Pt
Idle

KING & KING
Box 583, Big Bear Lake
LUCKY 13, 8 mi NE of Oro Grande,
undergr, Au
Idle

KINGSTON LEAD MNG CO
4080 Beverly Blvd, Los Angeles 4
KINGSTON LEAD MINE, San
Bernardino County, Pb, Ag
Trustee: Arthur C LaBran

KNEPPER, L W
Box 27, Indira
SANTA RITA, SANTA ANITA, SAN
CARLOS MINES, New Idria Dist,
San Benito & Fresno Cty, surface, Hg
EL CAJON MINE, Panache Dist,
San Benito Cty, surface, Hg
NORTH STAR MINE, San Benito Cty,
surface, Hg
Prod: 25 tons

KOKO WEEF CO, LTD
c/o D M Hodson
634 S Spring St, Los Angeles 14
CARBONATE KING ZINC MINE,
San Bernardino Cty, Zn, Ag
Idle

KORFIST, JERRY
Box 75, Baker
ORE FINE MINE, 13 mi E of Baker,
undergr, open cut, Au, Ag
Idle

KRITKOS, W T
308 W Euclid Ave, Stockton
OAT HILL MINE, E Mayacmas Dist,
Napa Cty, Hg
Prod: 10 tons

KUBON & JURVA
419 N Emilly, Anaheim
RAND MINE, Kern Cty, Glenville,
WO₃
Idle

LA GRANGE GOLD DREDG
1905 Mills Tower, San Francisco 4
Pres: Henry Elkhoff, Jr
Sec-Treas: Jefferson Koolittle
PLACER, La Grange, dragline, Au
Pt, Ir
Idle

LA PURISSIMA MNG CO
c/o Mr Fortind, 1414 Almaden Rd,
Los Gatos
NEW ALMADEN, Santa Clara Cty, Hg
Idle

LARIO, JOE P
Box 78, New Idria
SAMSON PEAK MINE, San Benito
Cty, Hg
Idle

LEWIS FOOD CO
817 E 18th St, Los Angeles 21
(See Black Bull Mine, Idaho)

LINCOLN CLAY PROD CO
Box 347, Lincoln
Pres: M J Dillman, Jr
VP: K S Brown
Sec-Treas & Purch Agt: A S Oulliford
MINE, 1 1/2 mi N of Lincoln, open
pit, fireclay
Mine Frm: C O Pardee
Prod: 450 tons
60-TON MILL

LIPPINCOTT LEAD MINES
Box 1811, Santa Ana
OWN: George Lippincott
LEAD KING MINES, Death Valley,
Ag, Pb, Zn
Supt: Gene Taylor
Prod: 50 tons
25-TON GRAV FLOT MILL, furnace
Supt: Neuman Bleh
SMELTER, Bonnie Clare, Nev

**LITTLE JULIA GROUP
QUARTZ MINES**
Shasta
Own: Eldred M Bickling, R E Bickling,
C E Plumb
LITTLE JULIA MINE, Shasta,
undergr, open pit, Au
Under devel

LIVE OAK MINES, INC
25556 N Sand Canyon Rd, Sausalito
Pres & Gen Mgr: Chalkner Thompson
VP: Thomas E Jackson
Sec-Treas: L B Thompson
MINE, open pit, titanium, strcon,
hafnium, Fe
Met: Victor Jager
Geol: H C Babbitt
Chem Eng: Samuel Sklarew
Under devel

LOVE STAR MINE
Topaz
Own: Wm B Taylor, Lou Barnett
MINE, 2 mi W of Coleville, open pit,
WO₃
Supt: Wm B Taylor
Idle

LUCKY BLACK JUNIOR MINE
Baker
Own & Op: Charles B Foster, 189
Eureka St, San Francisco
MINE, 40 mi from Shoshone, surface,
Mn
Idle

LUCKY JACK MNG CORP
10535 Buford Ave, Inglewood 2
Pres: L Mills Beam
VP: Harold D Kinney
Sec-Treas: Ross J Beam
LUCKY JACK MINE, Strawberry
Valley, placer, Au, Pt
Gen Mgr & Met: Major Allard

MACCO CORP., BARITE DIV

14408 S Paramount Blvd
Pres: John MacLeod
VP: John Robinson
Div Mgr: J D Hawkins
Gen Supt: Harry Parker
Purch Agt: Neil Gishler
BARITE QUEEN MINE, Box 266,
Inyokern, open pit, barite
Mine Supt: Clark Everett
Prod: 300 tons
200-TON GRAY MILL, Hwy 395,
5 mi S of Little Lake
Mill Supt: William Paine
(See Western Basin Corp)

MANGANESE KING MINE

Box 241, Parker, Arizona
Own: W Paul Robison
Op: D R Harryman
MINE, 9 mi W of Parker Dam, sur-
face, Mn
Idle

MARQUIS MNG CO

West Point
c/o James M Marquis
MARQUIS MINE, Calaveras Cty, Au
Idle

R W MAXWELL CO

P O Box 874, Sonoma
Pres: R W Maxwell
MINE, open pit, dolomitic limestone
MILLS, Columbia Marble Quarry

MC GUIRE MNG CO

39 Palma
Op: Clyde F McGuire
MISSION MINE, Riverside Cty, Au
Idle

MINERAL EXPLOIT CO

510 North 4th St, Blythe
REAL MC COY MINE, Riverside Cty,
open pit, U₃O₈
Under devel
WAR EAGLE MINE, Riverside Cty,
open pit, Mn
Gen Mgr: W A Caproni
Under devel

MINERAL MATERIALS CO

1145 Westminster Ave, Alhambra
Gen Mgr: C W Dunson
ATLAS SILICA MINE, P O Box 394,
Oro Grande, surface, silica quartzite
Gen Supt: Roy Hill
Mine Frm: Lloyd Balles
Ch Eng: M W Redhead
Prod: 200 tons
800-TON MILL, Oro Grande, jaw
crusher 7 rolls
(See Nevada)

MIRACLE MNG CO

(See Wyoming Gulf Sulphur Co)

MOLYBDENUM CORP OF AMERICA

Nipton
Gen Mgr: H D Bailey
Asst Gen Mgr: Russell Wood
Met: H S Woodward
MT PASS MINE, 60 mi SW of
Las Vegas, Nev, open pit, rare
earth metals
Mine Frm: Ira Proud
Prod: 150 tons
500-TON FLOT MILL
Mill Supt: O H Lee
Assay: Ralph Porter
(See Colo, N Mex, NY, Pa)

MORRIS RAVINE MNG CO

Box 7, Oroville
Pres & Gen Mgr: J H Sharpe
VP: Roy A Hundley
Sec: J R Peterson
MINE, 6 mi NE of Oroville, undergr,
Au

MOUNT GAINES MINE

Hornitos
Own: J W Radil, 444 California St,
San Francisco 4
MT GAINES MINE, Hornitos,
undergr, Au
Supt: J A Siefert
80-TON FLOT MILL
Under devel

MOUNTAIN COPPER CO OF CALIF

130 California St, San Francisco 11
Pres: L T Katt
Sec: Dudley F Miller
Treas: E G Rebacher
Purch Agt: S D Dodds
Sales Mgr: M M Stockman
BROWN MTN MINE, Matheson Station,
Reeding, Iron pyrites
VP, Op: C W McClung
Ch Eng: R K Barcus
Plt Frm: W H Calhoun
Prod: 500 tons

MT DIABLO MINE

Contra Costa County
MINE, Hg
Idle

MT SHASTA ASBESTOS CO

MT Shasta
EDDY CREEK MINE, Shasta County,
asbestos
Under devel

MUGWUMP MNG CO, INC

Forest
Pres: Virginia A Vivian
VP: Dr Stefan T Mayes
Sec-Treas: Fred W Rollyson
Purch Agt: Cecil T Vivian
MUGWUMP MINE, Sierra Cty,
undergr, Au

MULTI-MINES CORP

2550 E Olympic Blvd,
Los Angeles 23
Pres: John J Kennedy
VP: A F Escobar
Sec: Paul H Wayne
Treas: Fred L Clover
DEATH VALLEY TALC MINE,
Inyo County, talc
IREX MINE, Inyo County, clay

NAT'L LEAD CO, BAROID DIV

2404 Danville, Houston, Texas
HECTOR MINE & PLANT, Newberry,
undergr, bentonite
Supt: Jack Hereford
MERCED MILL, Merced, dry
grinding of barytes
Supt: Less Bunch
(See Ark, Kans, La, Mont, Mo, Nev,
NY, Tenn, Tex, Wyo)

NATIONAL TUNGSTEN CORP

6399 Wilshire Blvd, Los Angeles
Pres: Sol Posner
Sec: M Kaufman
Treas: Paul Hewitt, Jr
TYLER, ROUNDHILL, WISSEMAN
MINES, 148 N Main St, Porterville,
undergr & open pit, WO
Prod Eng-Chg of Oper: J Paul Jones
Mine Supt: James Mitchell
Mine Frm: C Moore
Geol: G T McCall
Prod: 100 tons
100-TON GRAY MILL, near Calif Hot
Springs
Mill Supt: Glen Wilder
Mill Frm: H West
Idle

NATOMAS COMPANY

607 Forum Bldg, Sacramento
Pres & Gen Mgr: R G Smith
VP: Mortimer Flisshacker, Jr,
Raymond W Ichey
VP & Sec-Treas: Chandler Lee
Asst Sec-Treas: Wanda Durkee
Chmn of Bd: R K Davies
Mgr Gold Dredging Dept: Cyril Thomas
PLACER MINE, Natoma, 20 mi E of
Sacramento, Au
See Colo

NELSON MINE

Box 124, Eureka
Op: Dayton Murray
PLACER MINE, 6 mi N of Orleans,
Au
Idle

NEW CHAMPION MINING CO

West Point
CENTENNIAL MINE, undergr, Au,
Ag, Pb
VP: H G O'Hanlon, Jr
Frnt: Dean Agnetti
FLOT MILL
Supt: R H O'Hanlon
Idle

NEW IDRIA MNG & CHEM CO

Iria
Pres: C Hyde Lewis
Sec-Treas: M A Burgess
QUICKSILVER DIVISION, Idria,
San Benito Cty, undergr, Hg
Div Supt: Wesley Shaddock
Geol: Robert K Linn
Mine Frm: Victor Sola
MILL, at mine
STRAWBERRY TUNGSTEN DIVISION,
1950 Tyler St, Fresno, undergr, WO
Div Mgr: Milan C Richardson
(See Colo)

NORTHWESTERN MINING CO

P O Box 3791, Seattle 24, Wash
Own: Alfred W Peeler
BOULDER GULCH GROUP, 8 mi W
of Sawyers Bar, Siskiyou County,
placer, Au
Supt: A Everett Miller
Idle

OMEGA CO

Emigrant Gap
OMEGA MINE, Nev Cty, hydraulic, Au
Idle

ORTOP MINE

Meadow Valley, via Quincy
Own: H E Fowler
MINE, 1 1/2 mi S of Bucks Lake,
undergr, Au, Ag
Under devel
6-TON GRAY QUARTZ MILL

ORIGINAL 16 TO 1 MINE, INC

1811 Russ Bldg, San Francisco 4
Pres-Gen Mgr: Wm M Maxfield
Sec-Treas: Jack Maxfield
VP: C A Bennett
MINE, Allegheny, Au, Ag
Gen Supt: C A Bennett
150-TON CONC & AMAL PLANT
Mill Frm: J B Hunley

ORTEGA MNG CO

117 Spurgeon St, Santa Ana
Officials: V P Anderson,
Earl Prevert
OLD DOMINION MINE, 6 mi W of
Elsinore, undergr, Pb, Zn, Ag
Idle

OWL SPRINGS CO, INC

(Joint Venture Group)
2001 W Artesia Blvd, Torrance
Officials: V P Anderson,
Earl Prevert
OWL HEAD MINE, San Bernardino
County, Mn

PACIFIC CLAY PRODUCTS

Box 2178 Term Annex, Los
Angeles 54
Pres: J D Fredericks
Exec VP: Kenneth Barrette
Sec-Treas: Walter M Colley
Purch Agt: Mary Baillie
FITE, Amador, Calaveras, Orange,
Riverside, San Diego, San Jose
Counties, clay & sand
FLOT MILL, Camanche
Mill Frm: Jack Hamill
Met & Sand Plant Mgr: Hugh Cole

PACIFIC FLUORITE CO

OF CALIFORNIA, INC
9813 Flower Ave, Bellflower
Pres & Gen Mgr: James A Grubb
VP & Gen Supt: Sherman M Linberry
Sec: Ralph R Burrows
Treas: Max H Falor
PACIFIC FLUORITE #1-7, Valley
Wells Station, Nipton, Clark Mt
mng dist, San Bernardino County,
undergr & open pit, CaF₂
Mech Eng: Fred Mitchell
Met: Herb Woodard
Elec Eng: Bill Sterling
Assayer: E Eisenhauer
100-TON FLOT MILL, near mine

PACIFIC INDUSTRIES, INC

Box 880, San Jose
Pres: Donald D Smith
VP: John R Plant
Sec-Treas: Ronald Bailey
Purch Agt: Nick Eliskovitch
CENTRAL EUREKA MINE, Sutter Cr,
undergr, surface, potash, P, V,
U₃O₈
Gen Mgr: Nick Eliskovitch
Geol: Robert E McDonald
(See Colo)

PACIFIC INSTITUTE

3101 Pasadena Ave, Los Angeles 31
Pres: H A Shiffer
VP: Rex James
Sec: A E Beaumont
Purch Agt: W Werneck
KERN FOURTEEN MINE, undergr,
WO
Idle

PACIFIC MINERALS CO, LTD

337 - 10th St, Richmond
Pres: C L Renwick, Jr
Sec: T H DeLap
**PLACERVILLE & SHINGLE
SPRING MINES**, asphalt, scapolite,
slate roofing granules
Mine Supt: G H Bishop
MILL
Supt: Ed Bishop
MINE, Whittie
Supt: Curt Wilson
MINE, Box 506, Eureka
Supt: Don Boughton

PACIFIC MNG CO

6327 Santa Monica Blvd,
Los Angeles 38
PINE TREE MINE, Mariposa Cty, Au
Idle

PALO ALTO MNG CORP

14800 Coleman Rd, San Jose 24
Pres: S S Ridgely, 3r
VP: George E Carlson, Fred W Smith
Sec-Treas: Virgil R Herring
MINES, Santa Clara & Alameda Ctn,
undergr & surface, Hg Cr₂O₃
Gen Mgr: G E Carlson
Prod: 10 tons
GUADALUPE MINES, (Carlito, Deep
Purple, Hillsdale, Cedar Mountain)
open pit, Hg₂Cr₂O₇
Field Supervisor: Virgil R Herring
80-TON GRAY MILL, 6 mi S
of San Jose Coyote Rd
SMEILER, Guadalupe, retort and
continuous feed
Prod: 150 flasks

PANCO MNG CO

5813 Fremont St, Oakland
BENTLEY RANCH MINE, Petaluma
Dist, Marin Co, surface, Hg
Idle

PANOCHE VALLEY QUICK-

SILVER MINES
Box 31, Paicines
LONE OAK & VALLEY VIEW MINES,
San Benito County, Hg
Idle

PERLITE INDUSTRIES, INC

Tecopa
Pres & Gen Mgr: Charles H Harrington
VP: Kenneth H Hysong
Treas & Mgr: William E Hysong
VP & Mine Supt: W R McQueen
Sec & Mill Supt: Ralph C Harrington
GREY EAGLE MINES #1, 2 & 3
Tecopa, surface, perlite
Asst Mine Supt & Purch Agt:
B B Bedeysnak
Asst Mill Supt: Charles Wough
Mill Frm: John Wheat
Mech Eng: Walton R Mammel
100-TON FURNACE

PERMIT MNG CORP

1063 Howard St, San Francisco
PERMIT MINE, Mariposa Cty, Au

PERON MNG & MLC CO

Piedra
Pres & Gen Mgr: EG Peron
Sec: Mrs Julia Peron
L & M MINE, Balch Camp via Fresno,
WO
Idle

PETERSON, HARRY

Box 53, Murphy's
WESTERN MINE, Sheep Ranch Dist,
Au

PHILLIPS, H J

1381 Chase Ave, El Cajon
PHILLIPS MINE, 2 mi SE of El
Cajon, undergr, Au, Ca, Pb
AMAL-GRAY MILL
Under devel

PIERCE BROS

595 2nd St, Morro Bay
HARD FACE GROUP, 1 1/2 mi SW
of Cerro Alto Lookout, San Luis
Obispo County, surface, Cr
25-TON MILL, 6 mi from Morro Bay

PIERCE & PETERSON

124 Ashdown Lane, Watsonville
LITTLE KING MINE, Parkfield
Dist, Kings County, surface, Hg

PIMA MNG CO

Pacific Mutual Bldg,
Los Angeles 14
Pres: H T Mudd
VP: A R Thomas, A Christensen
H S Mye, P W Allan
Sec: D Evans
Treas: C W Six
(See Ariz)

PIONEER MNG CO

350 Fell St, San Francisco
Pres: G J Stempel
CAMBRIDGE PLACER, 2 1/2 mi E
of N Fork, American Riv
Idle

PIONEER PYROPHYLLITE

PRODUCTS
Box 686, Chula Vista
Pres & Gen Mgr: Farrar Matthews
Sec: Dorothy Bessner
Elec Eng: Jim Vine
Mech Eng: Robert Wilson
MATTHEW MINE, near Del Mar,
surface, fire clay, pyrophyllite
Mine Frm: Elliott Williams
300-TON MILL, dry air flotation

PITTSBURGH PLAYS GLASS CO

Barlett
Mgt: George D Dub
MINE at Bartlett, Inyo Cty, chemicals
Asst Supt: Clark Dodge
Chief Chem: O M Knowles
Master Mech: G E Snyder
Idle

PLACERVILLE GOLD MNG CO

56 Clark St, Placerville
Pres: Reginald Owen
VP: Lillian Holland
Sec-Treas: L F S Holland
PLACERVILLE GOLD MINES,
undergr, surface, placer, talc, Au
Idle

POWATAN MNG CO

8721 Windsor Mill Rd
Baltimore, Md
Pres & Gen Mgr: P A Mow
VP & Sec: Ch Silver
Treas: E L Farley
Off Mgr: P E Mott
SHASTA COUNTY MINE, open pit
asbestos
Gen Mgr: J C Kempman
See Dal

PROVIDENCE TUOLUMNE GOLD MINES, LTD

310 Post St, San Francisco
Pres: Heri C Austin
VP: C C Celestre
Sec: F Groupho
PROVIDENCE MINE, 11 1/2 mi SE
of Sonoma, undergr, Au
Idle
COPPER BLUFF MINE, Humboldt
County, undergr, Cu, Au, Zn
Gen Mgr: J MacGinnis
Mine Supt: Paul Contini
50-TON FLOT MILL, 2 mi N of
Humboldt
Mill Supt: Ralph Hutchins
Asst Mill Supt: Lorraine McLenen

QUARTZ HILL MNG CO, INC

Scott Bar
Pres: L J Cuneo
VP: Clarence Garbott
Gen Mgr: R B McGinnis
Sec: J L Seligman, Jr
QUARTZ HILL MINE, Scott Bar,
Sierra County, surface, Au, Ag
Idle
250-TON GRAV MILL, Scott Bar

RADIL, J W

444 California Street, San
Francisco 4
MT GAINES MINE, Hornitos,
undergr, Au
Gen Mgr: J W Radil
Supt: J A Siefert
50-TON FLOT MILL
Under devel

RARE METALS CORP OF AMERICA

1st Security Bldg, Salt Lake City,
Utah
RARE 1-13 CLAIMS, Del Norte Cty,
Id

ALTOONA MINE, Box 15, Denonair,
undergr, Hg
Mine Supt: C C Ayers
Geol: S D Barber
Under devel
(See Ariz, Idaho, Utah)

RINCONADA QUICKSILVER MINE

Star Rd, Box 57A, Santa Margarita
Own: G P Bell
RINCONADA MINE, 12 mi E of
Santa Margarita, Hg
Idle

RIVER ROCK INC

Mgt: B M Dolan
GRAVEL PVT, Merced County

ROSSI HILL MINE

Box 181, Bishop
Own: J Rossi
MINE, 4 mi S of Bishop, undergr,
surface, WO
Op: Harry David, George, Laseley,
Andy Grassel
Idle

RYBERG, F E

Coulteville
CAL-PENN-TEX GROUP, Mother
Lode dist, Mariposa Cty, Au, Ag
Idle

S P LODE MINE

1361 Chase Ave, El Cajon
SP MINE, 7 mi S of Ocotillo in
Davies Valley, Imperial Cty Ocotillo
is on Hwy 80, undergr, open pit,
WO (Scheelite) 3 acre outcrop
Under devel

S & C MNG CORP

510 Hobart Bldg, San Francisco
Roy Hubbard, W H Caswell
BLACK DIAMOND MINE, Colusa
County, Mn
RATTLESNAKE, SOUTH THOMAS
MINES, Mendocino County, Mn
WHITE ROCK MINE, Lake Cty, Mn
Idle

SALMON RIVER MINES CO

Callahan
Pres & Gen Mgr: E C Latchem
Purch Agt: V W Peterson
TRAIL CREEK MINE, Au
50-TON FLOT MILL
Under devel

SAN GABRIEL VALLEY PLACERS

1237 S Greenwood Ave, Montebello
Own: Robert A Riggs
MINE, 2 mi W of Azusa, placer, Au,
Ag
GRAV MILL

SCHERLITE MINING CO

Box 32, Big Pine
WO
Idle

SCIOCHETTI, LOUIS

Box 637, Hollister
JUNIPER MINE, Paicines, undergr,
Hg
DAR MINE, San Benito Cty, surface,
Hg

SEVEN DEVILS MNG CO

1121 E Seventh St, Long Beach
Pres & Gen Mgr: Cartee Wood
VP & Asst Gen Mgr: L A Darland
Sec-Treas: Curtis T Vondy
See Idaho

SHADOW MT MINES

c/o Paul McHenry, Nipton
MINE, San Bernardino Cty, Ag, Pb
Idle

SHAMROCK MNG CO

c/o George Topliff, 241 Jones St,
San Francisco
SHAMROCK MINE, Sonoma Cty, Hg
Idle

SHASTA MINERALS & CHEM CO

612 Dooly Bldg, Salt Lake City 1
Pres: K L Saker
VP: Harper Hunsaker
Sec-Treas: Reed L Reeve
Asst Sec-Treas & Trf Agt: Nancy C
Hardman
WEST SHASTA COPPER ZINC DIST
MINE (Shasta-Phelps Dodge, Joint
Venture) Box 887, Redding, Ca, Zn,
S, Fe, Au, Ag
Gen Mgr: Walter C Lawson
Asst Gen Mgr: E E Mailhot
Mine Gen Supt: W J Walker, Geol
Mine Engr: Roger Patrick

SHERMAN PEAK MNG CO

Box 593, Kernville
SHERMAN PEAK & HILLTOP MINES,
Tulare Cty, undergr, surface, WO
90-TON GRAV MILL
Idle

H A SHIFFER ASSOCIATES

3105 Pasadena Ave, Los Angeles 11
Pres: Dr H A Shiffer
VP: H Beckelman
Gen Mgr & Supt: J H Stepp
Purch Agt: W Wernecke
Chief Eng: Dr Clarence A Lamb
VIRGINIA-POBO MINE, Pocono Creek,
Pine Mt Mng dist, Kern County,
placer, black sand, Cr, Ti, Zr, Au
Geol: H A Shiffer, Jim Stark
Met: Harold Ellis
Idle
FLOT MILL, at mine

SHOOTING STAR TUNGSTEN MINE

1124 W 2nd St, San Bernardino
MINE, undergr, WO, Ag, Au
Idle

SISKON CORP

Box 148, Happy Camp
Pres & Gen Mgr: H B Chessher, Sr
VP: E J Schrader

Sec-Treas: J E Chessher
SISKON MINE, Happy Camp, 41 mi
SW of Happy Camp, open pit, Au,
Ag

Gen Supt: H B Chessher, Jr

Prod: 150 tons

300-TON MILL, at mine

Mill Supt: A L McFarland

Mill Frm: Ralph Moody

(See Ariz, Nev)

SONOMA QUICKSILVER MINES, INC

Box 226, Guerneville
Pres: S R Smith
VP: H L Hotte
Sec-Treas: J W Cook
SONOMA QUICKSILVER MINE (MT
JACKSON MINE), Box 226,
Guerneville, undergr, Hg
Gen Mgr: C N Schuette
Gen Supt: Herbert F Larsen
Mine Supt: Douglas Myers
Mechanic: J L Gaili
Prod: 80 tons
100-TON MILL, at mine, rotary
furnace & condensers

SOUTHWEST OIL CO

548 Sunset St, Coalinga
BUTLER ESTATE #1 MINE, Fresno
Cty, 29 mi NW of Coalinga, open
pit, Cr

SOUTHERN CALIFORNIA MINERALS CO

320 So Mission Rd, Los Angeles
Own: W K Sheorch
Geol: Charles F Joy
Purch Agt: Dan Tash
DEATH VALLEY AREA TALC
MINES, Shoshone, talc
Mine Supt: Ben Gomes
75-TON AIR FLOT MILL,
Los Angeles
Mill Supt: Glen Hodges

SOUTHERN CROSS MINE

Box 178, Columbia
Gen Mgr: Charles M Bryan
Own: Grant, Bryan & Foster
MINE, 14 mi NW of Columbia,
undergr, As
Idle

SPANISH MINE

100 Palm Ave, San Rafael
Own: Louis R Moretti
MINE, Nevada Cty, surface, barryte
Prod: 30 tons
150-TON MILL, Florin
Mill Supt: Forrest Rhonon

SPAULDING, L B

Box 15, Ramona
METAL MT MINE, 20 mi NW of
Jacumba, undergr, WO
LITTLE THREE MINE, Ramona,
Pegmatite minerals

SULPHUR MNG & SUPPLY CO

1891 East Glenoaks Blvd,
Glendale
Pres: Grover Khorney
MINE, Inyo County, S
Idle

SUN VALLEY TUNGSTEN CO

11570 Pendleton St, Sun Valley
CUSTOM MILL, Los Angeles Cty,
WO
Idle

SUNSET MNG CO

213 Minna St, San Francisco
Pres: J L Balocchi
VP: W O Kay
Sec: Charles Greenberg
(See Ariz)

SURCEASE MNG CO

214 - 30th St, Sacramento
Pres: A M Boetting
Sec-Treas: J B Oes
ATOLIA MINES, Red Mountain, 3 mi
SE of Randsburg, surface, undergr,
WO
Gen Supt: Silas J Guy
Geol: Dion L Gardner
Master Mech: Silas Guy
100-TON FLOT MILL
50-TON GRAV MILL
Idle

SWEENEY TUNGSTEN CO, LTD

Box 185, Indio
Gen Mgr: E G Sweeney
Asst Mgr: Elmer Tubbs
Gen Supt: Dale Ervin
Geol: L Cornejo

PINTO BASIN LODE, Chuckawalla
dist, Au, Ag, WO
RAINBOW MINE, 30 mi E of Indio,
surface, scheelite, FeWO₄, Au, Ag
Idle

TAYLOR - KNAPP CO, THE CALIF DIV

640 Moraga St, San Francisco 22
Pres: S R Knapp
VP: A V Taylor, Jr & C P Knobel
Sec: A C Kreamer
Ch Eng: C P Knobel

TEX YOUNG MINES

Box 101, San Mateo
TEX YOUNG MINE, Lake Cty, Mn

THOMAS, WALTER

Box 100, Big Pine
TIP TOP MINE, Inyo Cty, WO,
Idle

THUNDERBIRD MINES DEVEL CO

21 Marcela Ave, San Francisco 16
Pres & Gen Mgr: Perry L Jones
CLIMAX MINE, Chilcoot, open pit,
Cu, Ag, Au, U₃O₈
Asst Gen Mgr: V E Jones
Gen Supt: L L Jones
Under devel
SILICON KING, open pit, SiO₂
Under devel
ANTELOPE MINE, Cu, Ag, Au,
Mo, W, Fe
Under devel

TIGHTNER MINES CO

Rm 549, 54 Sutter St, San Fran-
cisco
Pres: Robert E McCulloch
VP: W T Jenkins
Sec: Carlo S Morbio
Treas: J Malcolm Vishal
RED STAR GROUP, 1/2 mi N of
Allegany, undergr, Au, Ag
Under devel
50-TON GRAV MILL
(Leased to Endurance Mining Co)

TOTLAND BROS

Box 341, Leevining
Gen Mgr: O W Totland
BARBARA & BIG MUOGETT MINES,
12 mi NE of Leevining, Au, Ag, Pb
BRIGHT STAR MINE, 8 mi W of
Conway, undergr, Au, Ag, Pb, Bi
Under devel

TOYON MINE CO

c/o Alvin M Bentley, Rt 1,
Box 155, Calistoga
TOYON MINE, Napa Cty, Hg
Under devel

TREG MNG & MFG CO

Box 560, China Lake
Pres: C L Green
VP & Purch Agt: R E Ralston
Sec-Treas: W H Thorpe
BILLIE BURKE MINE, Randsburg,
undergr, scheelite
PIONEER MINE, Johannesburg,
undergr, Au
35-TON GRAV MILL, Randsburg

TRI-PARTNER MINING CO

831 E Main St, Stockton
Pres: Clifton Finley
Sec-Treas & Gen Mgr: LeRoy A
Washburn

SUNNY PLACER MINE, Buena Vista, placer, Zr, Ti, As

WONDER-QUARTZ MINE,
Groveland, undergr, Mn
Gen Mgr: LeRoy A Washburn
Asst Gen Mgr: Clifton Finley
Frm: Edmund Walters

TULARE BROS

2115 Jerome Prairie Rd,
Grants Pass, Oreg
Own: Eugene A Brown, Beatrice
Brown, Wanda Elliott
Supt: L V Tuare
HIGH PLATEAU MINE, Box 23,
O'Brien, Oreg, 25 mi W of O'Brien
in Del Norte Cty, Calif,
undergr, Cr, O₃
Idle

TULARE CO TUNGSTEN MINES

885 Lafayette Ave, Lindsey
Own: Dominick F Lavarella &
Sal Natoli, Jr
BIG JIM MINE, 18 mi NE of Lindsey,
undergr, WO
Prod: 15 tons
100-TON GRAV MILL, at mine
Idle

TURTLE MOUNTAIN MNG CO
P O Box 547, Earp
Part: A O Birch, Robert R Landrum, R
R G Van Horn
Gen Mgr: R G Van Horn
Met: L A Cornejo
Elec Eng: E E Clark, Jr
VIRGINIA MAY MINE, 10 mi W of
Vidal Junction, undergr, Cu, Ag, Au
Eng: L A Cornejo
Idle

NABBIT LEASE, 9 mi W of Cross
Roads, undergr, Mn
Act Mine Frm: Carl Nabbits
Mine Eng: L A Cornejo
75-TON MILL

TWINING LABORATORIES
2527 Fresno St, Fresno
Own: Fred Twining
FLOT, MAGNETIC SEPARATION,
prod-scale assaying
Met: Alex Vlau

TYSON MNG CO
Box 172, Smith River
MT VIEW MINE, Del Norte County,
Cr

UBEHEBE LEAD MINES, INC
513 S Spring St, Los Angeles 13
Pres: Grant Snyder
VP: E S Alexander
Sec: Allen Rankin
UBEHEBE MINE, Death Valley, 50
mi NE of Keeler, undergr, Pb, Zn,
Ag, Au
Leased

UNDERWOOD, H V & PRICE
M J
156 Locust Ave, Hollister
ANTELOPE COPPER MINE, 33 mi
SE of Hollister, undergr, Cu
MILL, at mine
Idle

UNDERWOOD, HORACE V
156 Locust Ave, Hollister
BITTER WATER QUICKSILVER
MINE, Panache dist, SE of
Hollister, Hg
Idle

UNION CARBIDE NUCLEAR
CO, (DIV OF UNION CAR-
BIDE CORP)
Bishop
PINE CREEK MINE, 27 mi NW of
Bishop, undergr, surface, WO₃, Mo
Gen Mgr: H L McKinley
Purch Agt: C A Smith
Mine Supt: L A Wright
Mine Frm: E J Birch
Eng: D J Markl
1,000-TON FLOT MILL, Pine Creek
Supt: L E Sousa
Plant Met: J E Martinson
Mill Frm: H G House
(See Colo, NY, Utah)

UNITED MERCURY PRODUC-
ERS ASSOC
18 Aliso Way, Menlo Park
OLD ALMADEN PROP, Santa Clara
County, undergr & open pit, Hg
RETORT

U S BORAX AND CHEMICAL
CORP, PACIFIC COAST
BORAX DIV
630 Shatto Place, Los Angeles 5
Pres: J M Geratley
VP: P J O'Brien
Purch Agt: J C Walker
Sec: W A Ackerman
Asst Gen Mgr: R F Steel
MINE, Boron, open pit, borate ores
Gen Supt: W J Diffley
Safety Eng: L P Clegg
Mine Supt: W H Wamsley
Asst Mine Supt: P A Conte
Frm: F M Smith
Eng: G T Olen
BORON REFINERY
Refin Supt: J T Young
Asst Supt: E D Lemon
(See N Mex, N Y)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
OPEN QUARRY, Midland, tyssum
Works Mgr: K Nepler
OPEN QUARRY, Plaster City, gypsum
Works Mgr: R W Deneke
(See Colo, Conn, Ill, Ind, Iowa, Mass,
Mich, Mont, Nev, N Mex, NY, Ohio,
Ohio, Tex, Utah, Va)

U S LIME PRODUCTS CORP
2244 Beverly Blvd, Los Angeles 57
Pres: I J Harvey, Jr
Exec VP: Kennedy Ellsworth
Res Mgr, Nevada: J C MacDonald
Res Mgr, Tuolumne County, Calif:
W W McCandlish
Supt, Sloan, Nevada: Geo Rodriguez
Supt, Apera, Nevada: C R Prince
Supt, Henderson, Nevada:
W E Mainor
Supt, Nelson, Arizona: James Curless
Purch Agt: E B Long
SONORA PLANT, Tuolumne County,
undergr
(See Ariz, Nev)

U S PUMICE SUPPLY CO, INC
6331 Hollywood Blvd,
Los Angeles 28
Pres: Sheldon P Fay
VP: L B Clark
Sec: Leona Steinhauer
Treas: George H Lindsey
Purch Agt: Wm C Wells
LEE VINING MINE & MILL, Lee
Vining, surface, pumice stone
Mine Supt: D H Campbell
GLASS MTN MINE & MILL, Tulelake,
surface, pumice stone
Mine Supt: Robert E Maggard

U S STEEL CORP
COLUMBIA - GENEVA DIV
120 Montgomery St, San Francisco
(See Alaska, Ala, Miss, Pa, Tenn,
Utah, Wyo)

UPPER PARADISE MINES
ASSOC, INC
P O Box 713, Barstow
Pres & Gen Mgr: H A Shiffer
VP: F T Leonetti
Sec: J Wyness
Purch Agt: Walter Wernecke
VERONICA MINE, San Bernardino
County, open pit, undergr, WO₃,
rare earths
Mine Supt: L Ciano
Geol: H A Shiffer
Met: Harold Ellis
Idle

UTAH CONSTR CO
(MINE OPERATORS & CONTR)
1 Montgomery St, San Francisco

VERDI DEVEL CO
2623 Hyperion Ave, Los Angeles 37
Pres: Mitchell G Kowalewski
VP: Edward Maszarino
Sec: Wendell Busnach
Dir: Hiram Lewis
Treas: Wm M Puharich
ROSAMOND URANIUM MINE,
Rosamond, U₃O₈
75-TON MILL, Mojave

VICTORVILLE LIME ROCK
CO
Box 548, Victorville
Pres: L K Ayers
Sec-Treas: E A Piercy
VICTOR QUARRY, open pit, limestone
Gen Mgr: E A Piercy
Gen Supt: Emil Deay
Geol: Robert Gessner
Mech Eng: George Stone
700-TON MILL, Victorville
Mill Supt: Emmet Ball
Asst Mill Supt: Perry Whittall
Mill Frm: Harold Hoehle

VOLK, H L
Oakdale
JUNIPER MINE, 44 Lambuth Ave,
Tuolumne Co, U₃O₈
Under devel

WAH CHANG MNG CORP
137 Clarke St, Bishop
Gen Mgr: J J Strutsel, Jr
Asst Gen Mgr: Geo Reed
Purch Agt: Wm F Spain
Geol: Byron W Works, Doug McIver
Met: Phil McGuire
Gen Supt: Bob Holmes
BLACK ROCK MINE, BENTON DIV,
undergr, WO₃
Mine Supt: Ned Phillip
Prod: 500 tons
GRAY-FLOT MILL
Mill Supt: Fred Yarcho
Idle
(See Colo, Nev, & E A Scholz & J H
Caster, Ariz)

WALKENG MINING CO
Box 126, Taylorsville
Pres: Ray B Wisler
VP & Gen Mgr: Alden H Hughes
Sec: Edson Able
MINE, 25 mi N of Taylorsville,
undergr, Au, Co, Ag
Under devel

WARNKEN, LOUIS JR
Box 37, Lone Pine
DURHAM, ST CHARLES FERNANDO
& ALAMEDA GROUP, Inyo County,
WO₃
Idle

WATKINS, J H
Scott Bar
LADY GREY MINE, Scott Bar,
undergr, Cr₂O₃
Prod: 10 tons
63-TON GRAY MILL, Scott Bar
Under devel

WEBB, DAVID L
O'Brien, Oregon
WEBB MINE, Del Norte County, Hg
Idle

WEST COAST CHROME
PRODUCERS
Box 324, Coalinga
Own: Jack James & Andrew Thickstan
Oper: J R Holman
MINE, 36 mi NW of Coalinga
Idle

WESTERN BARIUM CORP
110 Sutter St, San Francisco 4
Pres: J A Gorman
VP-Sec: A W Gorman
BARITE KING #1, 2, 3, 4, 5, 8
surface, barites
(Leased to Macco Corp)
MILL, Rosamond
Prod Mgr: James D Hawkins

WESTERN DEVEL CO
P O Box 1064, Blythe
Part: R S Hall & Maurice Willows, Jr
MINE, 18 1/2 mi NW of Blythe,
open pit
Idle

WESTERN REFRACTORIES
CO
Box 169, Ione
Pres: A C Gladding
VP: A L Gladding
Gen Mgr & Sec: O M Tupper, Jr
Gen Supt: N W Enaley
WESTERN TALC MINE, 14 mi SE
of Tecopa, undergr, talc, fire clay
Mine Supt: Marcus Seger
Ceramic Engr: Eivend Knutsen
MILL
Supt, Los Angeles, F C Frey
Supt, Dunn: A T Krebs

WESTERN TALC CO
1901 E Slauson Ave, Los Angeles
Pres: F H Savell, Sr
VP: Malcolm Stewart
WESTERN MINES, operating on know
Goose claim, 17 mi SE of Tecopa,
San Bernardino County, talc
Mine Supt: Marcus Seger
MILLS, Los Angeles and Dunn,
San Bernardino County
Capacity: 150 tons per day average

WHISKEY HILL MINE
Whiskey Town
MINE, Shasta County, undergr, Au
Idle

WHITE & RAY
Box 54, Orleans
PEARCH MINE, Humboldt County,
placer
Idle

WILLOW VALLEY MINES
CALIF, INC
461 Market St, San Francisco
Pres: Lee G McCoy
VP: Lowell B Hoff
Sec-Treas: George V Pettigrew
Purch Agt: L Manson
WILLOW VALLEY MINES, Nevada
City, undergr, Au, Ag, WO₃
Geol: J F Siegfried
Prod: 75 tons
MILL, Nevada City
Supt: Ed O Berger
Asst Supt: G E Hiller

WIND WHEEL MINE
Box 151, Columbia
Own: R O Greaves
MINE, undergr, Au, Ag
3 1/2-TON GRAY MILL, at mine
RETORT SMELTER, at mine

WYOMING GULF SULPHUR CO
Cody, Wyo
MIRACLE MNG CO PROP, near
Bakersfield, U₃O₈
Under devel

YELLOW JACKET CONS
GOLD MINES
120 Chester Ave, Bakersfield
Pres: Clifford Dickhut
VP: A F Bullard
Sec: James Ebert
Gen Supt: C J Ayres
Geol: B C Austin
MINES, Alleghany, undergr, Au, Ag

YRACABEL, V
Box 17, Middletown
JAMES CREEK MINE, E Mayacmas
Dist, Napa City, Hg

YUBA CONS INDUSTRIES,
INC
YUBA CONS GOLD FIELDS DIV
351 California St, San Francisco 4
Pres: John L McGara
VP, Mgr: C H Brittenham
Sec: E J Gorman
Treas: Carter P Thacher
MINE, Hammonston, Yuba City,
placer, Au, Sn
Gen Mgr: Clarence C Carlson
Asst Gen Mgr: J J Theisson
Geol: Leslie Gasaway
Mine Supt: Cecil Brophy

YUKOHL TUNGSTEN MNG CO
Box 39, Dunlap
Pres & Gen Mgr: R W Burge
THAWEEK MINE, WO₃
Mgr: S H Strickland
35-TON MILL
Idle

COLORADO

ACME URANIUM MINES, INC
404 First Nat'l Bank Bldg, Denver
Pres: J L Beaudin
VP: H W Luebke
Sec-Treas: E O'Rannon
GOOD HOPE, VEVADA, ATOM MINES,
undergr, V₂O₅, U₃O₈
Prod: 50 tons
Gen Mgr: John Obrecht
Mine Frm: Glen Chittenden
CHATAQUA MINE, Montezuma,
undergr, Pb, Ag, Zn, Au
Idle
Mine Frm: Leo Miller
65-TON LEAD FLOT MILL,
Montezuma
Mill Supt: W R Clark

AJAX MNG & OIL CO
Box 1075, Grand Junction
Pres: R F Gilmora
Sec-Treas: J R Cagle
AJAX & LUCKY DAY CAVE MINES,
6 mi SW of Gateway, undergr, U V
(Leased to Climax Uranium Co)

AJAX URANIUM CORP
154 Hancock St, Denver 4
Pres: T J Weaver
VP: Paul McWilliams
Sec-Treas: Frances R Waggener
73 CLAIMS, San Miguel Co, U₃O₈
Geol: T J Weaver
Under devel

ALEXANDER, EARL & LINNIE
Box 35, Ouray
LOST DAY, PATSY, & HELEN MINES,
Ouray, Ag, Pb, Zn

ALLEN URANIUM EXPLOR
Golden
SUCCESS GROUP, Gilpin County,
Ag, Pb, Zn

ALLIED CHEM & DYE CORP,
GEN CHEM DIV
Box 228, Boulder
Mgr, Mng Oper: Robert H Dickson
Asst Mgr, Mng Oper: Wilbert J
Trepp
JAMESTOWN MINES, 20 mi NW
of Boulder, undergr, CaF₂
Prod: 125 tons
Supt: James R Pennington
Mine Frm: Jack Mann
Master Mech: A W McIlwain
100-TON MILL
Mill Frm: T J Hinshaw
(See N Mex, Mo, NY, Va)

ALTA URANIUM INC
100 & Grand, Grand Junction
Pres: R E Dorwart
VP: Tom Casto
Sec: O O Taylor
Treas: G R Simpson
(See Ariz)

ALTAMONT MNG CO
30 E 10th St, Bountiful, Utah
Gen Mgr: Geo Schultz
MINE, near Gunnison, U₃O₈
Under devel

ALTA VISTA URANIUM & OIL CO
378 Main St, Durango
U₃O₈ Prod
Under devel

AMBASSADOR OIL CORP
Box 9338, 3101 Winthrop Ave,
Ft Worth, Texas
MINERAL PARK #4 MINE, 808 Road
Ave, Box 413, Grand Junction,
undergr, U₃O₈, V
Eng: Francis K Corbett
(See Texas)

AMERICAN GILSONITE CO
134 W Broadway, Salt Lake City,
Utah
Pres: E F Goodner
VP: R E Nelson
Sec-Treas: E H Owen
Asst Prod Mgr: John M Baker
COKE PLANT-REFINERY, Gilsonite
Supt: J L Boyce
Mgr: L P Morris
(See Utah)

AMERICAN LEDUC URANIUM
300 N 6th, Grand Junction
HENDERSON #1 MINE (ECONOMY
CLAIMS), Outlaw Mesa area,
Mesa County, U₃O₈
PROPERTIES, Moffat County, U₃O₈
(See Utah)

**AMERICAN METAL CLIMAX,
INC**
61 Broadway, New York 6, NY
Chmn of Bd: Arthur H Bunker
Pres: Hans A Vogelstein
Sec: Erwin A Weil
Treas: Donald J Donahue
CLIMAX MOLYBDENUM CO DIV.
VP, Western Oper: Frank Coolbaugh,
Mines Park, Golden
Dir of Explor: John Carson, Mines
Park, Golden
Met: R E Cuthbertson, Mines Park,
Golden
CLIMAX OPERATIONS, Climax
Res Mgr: Robert Henderson
Gen Supt: Edwin J Eisenach
Asst Gen Supt: John Petty
Geol: Stewart Wallace
Elec Eng: Urban Toucher
Ind Mat Dir: R C Miller
Planning & Devel Eng: Max Gelwick
MINE, undergr, Mo₃, WO₃, Fe₃
S
Mine Supt: William Distler
Asst Mine Supt: Joffre Johnson,
Charles Cleaves
Mine Frm: Tom Phipps, Bill Nelson
Prod: 34,000 tpd

**AMERICAN SMELTING &
REFINING CO**
909 First Nat'l Bank Bldg,
Denver 2
Mgr: J Paul Harrison
ARKANSAS VALLEY PLANT, Pb
Box 973, Leadville
Supt: T P Fahy
Asst Supt: L C Travis
Metallurgists: M D Rood, R Enoch,
P A De Santis, C Cohenour,
Wm Sweet
Master Mech: C Hopfinger
Chief Acct: Edward J Kelly
Safety Eng: Frank Stevens
Plant Eng: R L Armbruster
Ch Assayer: R J Elliott
Ch Chem: Max Kasten
GLOBE PLANT, Denver, Cd
Supt: W L Miles, Jr
Asst Supt: Max Coala
Safety Insp: J J Ryan
LEADVILLE MNG DEPT
Mine Supt: A Haevel
IDEX-SUNDAY, ECLIPSE-IRENE,
FRYER HILL & ROBERT EMMETT
OPNS, Zn, Pb, Au, Ag
Idls
(See Ariz, Calif, Idaho, Ill, Kans,
Md, Mont, Neb, N J, N Mex, N Y
Tx, Utah, Wash, & Federal Mng
& Smelting Co, Mo)

AMPET CORP
Colorado Bldg, Denver
Pres: R A Gas Davis
Sec-Treas: Alfred O Bremer
MINE, San Miguel County
U₃O₈ Prod
(See Arizona, Utah)

ADDRESS, CLYDE & ASSOC
Placerville
PAYROCK MINE, Mesa County, U V

ANDREWS, K M & D K
Box 87, Nucla
BADGER MINE, undergr, U₃O₈,
V₂O₅
JUPITER MINE, Gunnison County,
U₃O₈, Cu
Under devel

ANNA C MNG CO
c/o Olin B Scott, Rye
ANNA C MINE, Boulder County,
WO₃
Idls

**ANSCHUTZ DRILLING CO,
INC**
1411 Mile High Center Bldg, Denver
Pres: Fred B Anschutz
VP: J H Castler
Sec: G Michael Morris
Geol: Louis Gas, W W Lyons
AMERICAN EAGLE MINE, Gypsum
Valley, undergr, open pit, U₃O₈
Prod: 30 tms
(See Wyo)

ARBOGAST, H L
Rt 4, Grand Junction
U₃O₈ Prod

ARGO MNG CO
P O Box 1698, Grand Junction
Managing Part: Lyle F Campbell
LOST DUTCHMAN MINE, Beaver
Mesa County, undergr, U₃O₈,
V₂O₅
Mine Frm: John Honstein

AROYLE MNG & MFG CO
670 Pearl St, Denver
MINES, San Juan Cty, Au, Ag, Cu,
Pb, Zn
Under devel

ATLAS MINING & MILL CORP
Box 307, Grand Junction
Pres: Alan A Fisher
VP: Frank Fleming
Sec-Treas & Purch Agt: Warren
Bassham
HAWKEYE MINE, Crested Butte,
undergr, Au, Ag, Pb, Zn, Cu
Gen Mgr: Warren Bassham
Geol: Raymond C Robeck
Idls
75-TON FLOT MILL

**ATOMIC FUEL EXTRACTION
CORP**
Bedrock
Pres: J C Turner
VP: L M Buhler
Sec: John R Black
URANIUM MILL, Bedrock, Montrose
County
(AEC has authorized mill contract)
Idls

AURORA URANIUM CO
317 Main St, Grand Junction
LITTLE JOHNNIE MINE, Mesa
County, U V

AUSMUS & HIGHTOWER
Naturita
U₃O₈ Prod

AVSMUS & STAATS
Naturita
U₃O₈ Prod

B&B MNG CO
Albuquerque, N Mex
U₃O₈ Prod

BACHELOR MINE
c/o Carl Dismant, 3037 Birch
St, Denver 7
MINE, near 4 Mile, Ouray, undergr,
Pb, Ag, Zn, Au, Cu
Idls

BALBOA MNG & DEVEL CO
P O Box 961, Grand Junction
Pres: William M Spencer, Jr
VP: Albert F Stoick
Sec-Treas: Laurence G Duerig

BALD EAGLE MNG CO
Travel Center Bldg, 1640 Court Pl,
Denver
(A joint venture between Jackpot Oil
Co and Hafen Leavitt)
BALD EAGLE MINE, Idaho Springs,
undergr, Au, Pb, Ag, Cu, Zn
Gen Mgr: R Gerald Hughes, Hafen
Leavitt
Mine Supt: D Crawford
Mine Eng: John H McElroy
Prod: 50 tons
135-TON FLOT MILL, at mine
Mill Supt: Charles Quinn
SMELTER, Leadville

BARD CREEK MINE
Empire
Own: A F Mayham
MINE, near Empire, Au, Ag, Pb, Zn
Under devel

BARKER, DELBERT W
P O Box 263, Nucla
U₃O₈ Prod

BARKLEY AND CO, INC
Box 8, Cripple Creek
Pres: A C Denman
VP: George F Stiner
Treas: Eugene Beagles
AEC RESERVE BLOCK 4 MINE,
Box 554, Uravan, undergr, U₃O₈,
V₂O₅
Geol: Elmer V Retshardt
Mine Supt: Troy E Wade
Mine Frm: M K Doyle
Prod: 5 tons

BARTON URANIUM CO
304 Uranium Center Bldg, Grand
Junction
Pres: F W Barton
Sec: Olive H Roy
PAY DAY GROUP, Uravan, 12 mi W
of Uravan, U₃O₈, V
Supt: Wm Doertenbach
Geol: J M Harlan

**BEAVER MESA URANIUM
INC**
P O Box 587, Grand Junction
Pres: Alan M Simpson
VP: Julian M Simpson
Sec-Treas: Mark Holloway
RAJAH-CHEROKEE-PACKRAT,
Gateway mng dist, undergr, U₃O₈,
V₂O₅
Gen Mgr: Alan M Simpson
Mine Supt: Vernon Lehr, Henry Lehr
Asst Mine Supt: Frank Gray Deal
Prod: 200 tons

BEE - SHO - SHEE MNG CO
c/o George Newitt, Fruita
Idls
(See Ariz)

BENHAM, RAYE
Dolores
U₃O₈ Prod
Idls

BERTOCH, B H
P O Box 85, Engar
U₃O₈ Prod

BERYLLIUM MNG CO, INC
Box 378, Gunnison
Pres: J R Wemlinger
Gen Mgr: C A Wemlinger
VP: J E Sheets
Sec: J T Dickey
OHIO CITY MINE, 22 mi from
Gunnison, surface, beryl, mica,
feldspar, tantalite, columbite
Under devel

BINDER, F V
Naturita
U₃O₈ Prod

**BISHOP CANYON URANIUM
CORP**
Box 2016, Robbs, N Mex
HOGBACK MINE, Dove Creek,
undergr, U₃O₈, V₂O₅
Lessee: Bob Estes
Prod: 5 tons
(See N Mex)

BLACK GIRL MINES CO
2815 Hollis St, Bakersfield, Calif
Box "M", Ouray
VP: J M McFadden
BLACK GIRL MINE, Ouray, undergr,
Ag, Cu, Pb, Au
RED MT MINE, Red Mt, undergr,
Ag, Cu, Pb, Au
Gen Mgr: J M McFadden
Geol: Dr C M Shaw
Idls
(See Calif)

BLACK MNG CO
Silverton
SILVER LEDGE MINE, San Juan
County, Ag, Pb, Zn
Idls

BLUE CREEK MNG CO
c/o Esther S Crane, P O Box 286,
Aste, N Mex
U₃O₈ Prod

BLUE RIDGE MINES
c/o B L Groth, 1434 Filmore,
Denver
BLUE RIDGE MINE, Clear Creek
County, Au
Idls

BONITA MNG & DEV CO
Box 186, Silverton
Pres: F C Brightly, Jr
Gen Mgr: H P Ehrlinger
Sec: V G Rinn
LEAD CARBONATE MINE, 11 mi
NE of Silverton, undergr, Au, Zn,
Pb, Ag, Cu
PRIDE OF BONITA MINE, 11 mi
N of Silverton, undergr, Pb, Ag, Zn
EMMA-OREGON GALENA GROUP,
San Juan County, Zn, Pb, Ag
Under devel
50-TON FLOT MILL, Gladstone
Supt: H P Ehrlinger
Idls

BORALIS MNG CO
Aspen
Pres: Alton Beck
MONTEZUMA MINE, Pitkin County,
Ag, Pb, Zn
Idls

BRIDGER - JACK INC
160 W Main St, Grand Junction
Pres: Garth W Thornburg
VP: O E Thornburg
Sec: J E O'Connor
Idls
(See Utah)

**BRITISH WESTERN AMERICA
URANIUM CORP**
621 1st Security Bank Bldg, Salt
Lake City, Utah
GRIZZLEY MINE, Georgetown,
undergr, Pb, Au, Ag, Cu
Gen Mgr: Robert A Stubblefield
Mine Supt: Tim Wade II
Prod: 100 tons
110-TON FLOT MILL, Georgetown
Mill Supt: Charles Federhauf
Idls
(See Utah)

BROWN MINES
P O Box 243, Montrose
U₃O₈ Prod

BUCKEYE MNG CO
123 Myrtle Pl, Cortes
U₃O₈ Prod

BUCKSKIN JOE MINES, LTD
Alma
Gen Mgr: C W Jordan
PHILLIPS MINE, undergr, Au, Ag,
Cu, Pb, Zn, Fe
Under devel

BUFFALO HEAD MNG CO
P O Box 964, Craig
U₃O₈ Prod
Under devel

BUNKER & CO
P O Box 153, Naturita
U₃O₈ Prod

BURKE - MARTIN MINES, INC
901 Sherman, 1st 1411, Denver 3
BURKE GROUP, Summit County,
Ag, Pb, Zn

BURNETTE, RUEY F
207 Uranium Center, Grand Junction
BURNETTE #3 MINE, Long Park Area,
Montrose County, undergr, U₃O₈,
V₂O₅
Gen Mgr: Grant H Huntley
Mine Frm: Paul P Paverjon
Prod: 30 tons
(Leased from Vanadium Corp of Amer)

BURREL, DOROTHY M
Mackay
U₃O₈ Prod

CS&H MINING CO
2512 W 9th Ave, Denver,
LAST CHANCE-GUNNISON CTY-
feldspar

CADWELL MNG CO
c/o Vernon L Phillips, 504 W 8th St,
Leadville
HAYDEN SHAFT, Ag, Pb, Zn
Idls

CAMOOSE URANIUM MINES
P O Box 113, Grand Junction
U₃O₈ Prod

CAMP BIRD LTD
70 Pine St, New York 5, NY
Chmn: John Daigleish
Cons Eng: C Maxwell Norman
Sec: Ian Whyte
CAMP BIRD MINE, Ouray, undergr,
Pb, Zn, Cu, Au, Ag
Idls
Chf Geol/Act Mgr: C P Tremlett
Mine Frm: Walter Smith
Mine Eng: H Coppin
(See N Y)

CANFIELD, ARTHUR
P O Box 84, Dove Creek
U₃O₈ Prod

WM J CAREY MNG CO
634 Road Ave, Grand Junction
Mgr: Harry E Haynes
Dist Geol: Don W Fieldman
Explor
(See Ariz)

CARPENTER, MORRISON
URANIUM & OIL CO
P O Box 354, Moab, Utah
U₃O₈ Prod

CATARACT MNG CO
(See San Juan Mng & Devel Co)

CENTRAL URANIUM & MLO
CORP
Box 277, Central City
Gen Mgr: George C Richart
MINES, Gilpin County, Au, Pb, Zn, Cu,
Ag, U₃O₈
Idle

CHAMPION MINES CO
841 Monroe St, Denver 8
Pres: Jesse Simmons
Sec: J J Simmons
MORNING STAR & LAST CHANCE
MINES
LEASES ON JERRY JOHNSON, WPM
& FOREST QUEEN MINES,
Cripple Creek, undergr, Au
Idle

CHAVEZ, J A
P O Box 418, Nederland
BONANZA PLACER, W₃
Idle

CHEROKEE MINES
231 S Grant Ave, Ft Collins
Pres: T H Sackett
VP: V E Crum
Sec-Treas: Jan H Andrews
BLACK HAWK #1 & 2 MINES,
undergr, U₃O₈
Gen Mgr: T H Sackett
Idle

CHEROKEE URANIUM MNG
CORP
1507 Mile High Center, Denver
Pres: James S Henderson
MINES, Gilpin County, Au, Ag, Cu,
Pb, Zn, U₃O₈
Idle

CHESAPEAKE & COLORADO
CORP
909 H St, NW, Washington, D
D C
135 S 4th St, P O Box 1288,
Grand Junction
Pres: Francis M Thompson
VP: Lytle Brown, Jr
Sec: Gillis W Long
Treas: Howard Riser
CALEDONIAN MINE, Silverton, Ag,
Pb, Zn
Gen Mgr: Lytle Brown, Jr
Gen Supt: Dabbs Hubbard
Idle
(See NC)

CINDERELLA URANIUM &
OIL, INC
905 McBurnett Bldg, San Angelo,
Texas
KING SOLOMON #1, c/o Spencer
Heights, Belvue, undergr, U₃O₈
Gen Mgr: Marvin C Ham
Geol: Mark A Eidebuch
Elec Eng: Nicholas A James
Field Supt: Douglas A Williams
Mine Supt: Halvey M Rinko
(See Texas)

CLIMAX MOLYBDENUM CO
DIV (SEE AMERICAN METAL
CLIMAX, INC)

CLIMAX URANIUM CO, (SUBSID
OF AMERICAN METAL CLIMAX
INC)
Box 1901, Grand Junction
Pres: Frank Coolbaugh, Mineo Park,
Golden
VP & Gen Mgr: A M Mastrowich
Purch Agt: L J Duggan
Consult: E J Duggan
MINES, near Grand Junction, undergr,
U₃O₈, V₂O₅
Mgr Minors: L J Brewer
Prod Supt: T E McCandless
Gen Pres: Andy O'Kora
Ch Geol: R J Wright
Geol: R P Dunsell, P Dunsell, J
W A Roberts, R M Warner,

EDDIEBIE, R T Mahonka
ET Anderson, J C Moore
CHEM MILL, Grand Junction
Mgr: R C Toerper
Asst Supt: Paul Wire
Master: Wm G K Barthart
Ch Met: R E Hargrove
Ch Chem: Q S Kocher
(See Ariz, N Y, Utah)
34,000-TON FLOT MILL, at mine
Mill Supt: Frank Windolph
Asst Mill Supt: Fred Hoff
(See NY, Pa)

CLYDE URANIUM MINES
P O Box 54, Moab, Utah
U₃O₈ Prod

COCREHAM, W A
3185 W Colorado, Colorado Springs
VALLEY VIEW MINE, mica, feldspar
Idle

GOO MINERALS CORP
Denver Club Bldg, Denver
Pres: W C Norman
VP: J H Nelson
Treas: D F Taylor
Purch Agt: Edw McDonald
(See Utah)

COLD SPRING TUNGSTEN,
INC
1st Nat'l Bank Bldg, Denver
Pres: Boris Pregel
VP: Alexander Pregel
Sec: Paul Newton
COLD SPRING MINE, Nederland,
undergr, W₃
Gen Mgr: Dr G C Ridland
Asst Gen Mgr: Chas H Turner
Mine Supt: Sam D Walter
Prod: 30 tons
50-TON GRAV MILL, Nederland
Mill Supt: Wm R Nolan
Idle

COLONIAL NUCLEAR
INDUSTRIES, INC
45 United States Bank Bldg,
Grand Junction
Pres: C W Schrader, R D Hughes,
W Hasselbush
Sec: O S Halvorson
Treas: O M Duckett
Idle

COLO AGGREGATES CO, INC
Mesita
Pres: Geo M Oringdolph
VP: W W McClintock
Sec-Treas: Henry Guller
MESITA HILL MINE, 2 mi W of
Mesita, surface, volcanic scoria,
Gen Mgr: Geo M Oringdolph
Frm: Robert Compton
Prod: 300 tons

COLO FUEL & IRON CORP
Continental Oil Bldg, Denver
Pres: A F Frant
Sec: D C McGrew
Treas: H C Crout
MINING DEPT, Box 315, Pueblo
VP, Oper: J J Martin
Dir, Purch: L C Ross
Mgr, Mines: R R Williams, Jr
Ch Eng: Mng Dept: W J Schmier
Ch Geol: D A Carter
Ch Elec: J W Irwin, Trinidad
MONARCH QUARRY, Limestone,
Salida
Supt: J E Whitney
Prod: 2,000 tons
CANON DOLOMITE QUARRY, Canon
City
Supt: E C Jagow
Prod: 215 tons
(See Utah, Wyo)

COLO GOLD KING MINES,
INC
Box 198, Silverton
Pres & Gen Mgr: H P Ehringer
VP: A D Miner
Sec-Treas: V W Tookey
GOLD KING MINE, undergr, Au, Ag,
Pb, Zn, Cu
Idle

COLO TRI-STATE MNG CORP
332 Colorado Nat'l Bank Bldg,
Denver
Pres: G F Hardwick
VP: A Kaneberg
Sec: J J Foley
Treas: Walter Wilson
MINE, open pit, CaF₂
500-TON HEAV-MED MILL, Dillman
Idle

COMINCO COOPERATIVE MNG
CO, LTD

Dove Creek
Pres: H C Skeels
VP-Sec-Treas: R L Schwendemann
COMINCO COPPER MINES, Wet Mt
Valley, Westcliffe, Cu
MINE, Slick Rock, U₃O₈, V₂O₅
Prod: 100 tons
Gen Mgr: R L Schwendemann
Mine Supt: H C Skeels
Asst Mine Supt: R E Lehmann
Mine Frm: Thomas L Duncan
150-TON MILL & LEACHING PLANT,
at copper mine

COMMERCIAL MNG, INC
Box 303, Marshfield, Wisc
RESERVATION MINE (leased),
undergr, U₃O₈, V₂O₅
Under devel
(See Wisc)

CONGRESS URANIUM CORP
402 Darling Bldg, Salt Lake City,
Utah
Pres: Leo G Meredith
Sec-Treas: Karl F Buell
CONGRESS MINE, Bull Canyon
Under devel

CONSOL GOLD - URANIUM
CORP
309 Columbine St, Denver 8
Pres: R E Harker
VP & Purch Agt: Ralph Bradley
Sec-Treas: R L McCoy
Gen Supt: C L Barker
Mech Eng: H E Grosvener
Mine Supt: Leslie Barker
TREASURE KEY TUNNEL, Blackhawk,
undergr
Under devel
JOHNNY BULL, Silver Plume, undergr,
Ag, Pb

CONTINENTAL MATERIALS
CORP (FORMERLY CONTIN-
ENTAL URANIUM, INC)
820 S Ninth St, Grand Junction
Pres: Willard Gidwitz
Sec: Max H Braun
Bd Chmn: Gerald Gidwitz
Gen Supt: C H Reynolds
Under devel
(See Utah, Wyo & Woodmont, Ind, Utah)

COPELAND, THOS A &
KNIGHT, JAMES A
213 E 6th, Hinsdale, Ill
EL PASO GROUP, et al
CRIPPLE CREEK, Teller County

CORONADO COPPER & ZINC
CO
439 1/2 Main St, Grand Junction
Under devel

COSTELLO LEASE
Bonanza Rt, Villa Grove
Op: W J Costello
RAWLEY MINE, Bonanza, 30 mi
NW of Villa Grove, undergr, Pb,
Zn, Ag, Cu
Prod: 10 tons

COUCH & TRONE
Naturita
U₃O₈ Prod

CRAZY GIRL MNG CO
Idaho Springs
CRAZY GIRL MINE, Ag, Pb, Zn

CRESCENT URANIUM MINES,
INC
Denver
CRESCENT CLAIMS, Outlaw Mesa,
Montrose County, U₃O₈

CRESSON CONSOL GOLD MNG
& MLO CO, THE
Box 127, Cripple Creek
Pres: Merrill E Shoop
VP & Gen Mgr: Max W Bowen
Sec: H Bates
Supt: Wilbur Wasson
Mech Eng: Geo Lorens
Purch Agt: H L Stone
MINE, 3 mi E of Cripple Creek,
undergr, Au
Mine Supt: A H Bebee, Jr
Prod: 150 tons

CRIPPLE CREEK MNG &
MLO CO
Box 247, Cripple Creek
Pres: Lisle Hagler
Sec: John Adair
Gen Mgr: Richard B Walls
GOLD KING MINE, 1 mi from
Cripple Creek, undergr, Au
Idle
(See Ariz)

CROWN MNG CO
123 N 8th, Grand Junction

CROWN URANIUM COMPANY
Box 183, Casper, Wyo
LOST BROTHERS MINE, Norwood,
Bull Canyon Dist, surface, U₃O₈
TOM CATS MINE, Mineral Mt,
surface, U₃O₈
Gen Mgr: D B Wade
Gen Supt: Ray Barron
Under devel
(See Utah, Wyo)

CRUSADER OIL & URANIUM
CO
1717 E Colfax Ave, Denver 18

Pres: James R Macon
VP: Dwight H Elder
Sec-Treas: H C Bartholomew
Under devel

CULLEN MINERALS CORP
610 Road Ave, Grand Junction
Pres: Lucien H Cullen
VP: K D Kaasch
Sec-Treas: T N Tucker
(See Utah)

CUMBERS MNG CO, INC
Box 884, Alamosa
Pres: Wiford W Myers
VP: Richard Frink
Sec: Pedro Vigil
Treas: Brownie Clark
Gen Mgr: C O Roascher
CLAIMS, Sangre de Cristo Range,
N of Alamosa, rare minerals
REDWING LEASES, near Redwing,
U, V, cerium, rare earths
Under devel

CYPRUS MINES CORP
439 1/2 Main St, Grand Junction
URANIUM CLAIMS
Under devel
(See Ariz, Calif)

D & J URANIUM & EXPLOR
CO

325 N Santa Fe, Pueblo
Pres: Russell L Jewett
VP: Frederick E William
Sec: Tom Harkness
Treas: Soaman I Jewett
Dir: Garrett Fonda
BONITA MINE, Pueblo, undergr,
U₃O₈
Mgr: S A Jewett
Asst Mgr: R L Jewett
Under devel

DALLAS URANIUM & OIL
CORP
322 Mercantile Commerce, Dallas,
Texas
U₃O₈ Prod
Under devel

DAN C MINING CO & C & D
MNG CO
4 Brethower Bldg, Montrose
Pres-Purch Agt: Daniel S Closser
VP & Sec-Treas: Victor F Crepeau
MYSTERY & SARAH ELLEN,
Siltrock, undergr, U₃O₈, V₂O₅
Asst Gen Mgr: Russ F Delista
Genl: Bill Morris
Mech Eng: Joe Valsequez
Prod: 30 tons

DAVENPORT, W L
Breckenridge
WELLINGTON MINE, 3 1/2 mi E
of Breckenridge, undergr, Pb, Zn,
Ag, Au
Mine Supt: Harold Horn
Mine Eng: Marvin Burger
Idle

W L DAVENPORT & DR F F
GROSS, Operator
Box 182, Breckenridge
MINNIE MINE, 3 mi E of Brecken-
ridge, Summit County, Au, Ag, Pb, Zn
DEAL MINING COMPANY, INC
Suite 23 America Bldg, Ft Collins
Pres: Arthur G Wykert
VP: Melvin A Wykert
Sec-Treas-Purch Agt: Frank G Hooper
BLACK JUMBO MINE, Blue Mesa
Ming Dist nr Uravan, undergr,
open pit

DEFENDER MNG CO
660 Enid, Okla & Silver Cliff
Part: Roy O Pratt, Vic Greer, Enid
E F Stacy, Wm Cody, Silver
Cliff
DEFENDER MINE, undergr, Pb, Zn,
Ag
Gen Mgr: E F Stacy
Under devel

DENVER - GOLDEN OIL & URANIUM CO

760 Denver Club Bldg, Denver
Pres: Charles O Parker
VP: G H Brodie
Sec: Roy O Goldin
Treas: Barney Janow
SCHWARTZWALDEN MINERALIST (Ralston Creek), Box 109, Golden, Jefferson County, U₃O₈
Mine Mgr: E C Rice
Asst Mine Mgr: Clyde I Trus

DENVER NABOS MNG CO

Lawson
NABOB MINE, Clear Creek County, Ag, Pb, Zn
Idle

DEVEREAUX BROTHERS

P O Box 373, Meeker
U₃O₈ Prod

DOUG DEVERICH MNG CO

1139 Colorado Ave, Grand Junction
Under devel

DILLON, RICHARD

Genl Del, Cortez
U₃O₈ Prod

DIVERSIFIED RESOURCES INC

301 N 5th, Grand Junction
PROPERTIES, Gateway Mng dist, Mesa County
(See Utah)

DOEPKE MNG CO

2431 N Nevada Ave, Colorado Springs
Mgr: Frank D Doepke
GOLD KING, LEXINGTON, & MATTIE L MINES, Teller County, Au
Idle

DOUBLE BUCK URANIUM INC

3239 West 3500 South, Salt Lake City, Utah
Pres: B H Bertoch
VP: W H Bertoch
Sec-Treas: Allen K Bertoch
WALLY #1 MINE, Eggar, undergr, U₃O₈, V₂O₅
Gen Mgr: B H Bertoch
Mine Supt: Byron Holt
Under devel

DOWELL & ASSOCIATES

Montrose
U₃O₈ Prod

DOYLE URANIUM CORP

Box 1421, Colorado Springs
Pres: M K Doyle
VP: J D Stone
Sec-Treas: E G Untiedt
PITCH FORK MINE, Naturita
Gen Supt: Jim Galyean
Geol: Cleo Bascom
Undergr U₃O₈ prod

DULANEY MNG CO

312 First Nat'l Bank Bldg
Grand Junction
Pres: R O Dulaney
VP: C H Dulaney & Harry B Friedman
Sec-Treas: Thomas E Potts
Gen Mgr: Frank H MacPherson
Gen Supt: Leroy Hemphill
Geol: Philip P Powers
RADIUM GROUP OPER, 31 mi N of Dove Creek, undergr, U, V
Prod: 175 tons

R L DUNCAN MNG CO

P O Box 92, Dove Creek

WALTER DUNCAN MNG CO

2212 1st Nat'l Bldg, Oklahoma City, Oklahoma
U₃O₈ Prod
(See Ariz)

E & H LEASING CO

Meeker
BURRELL #1 & LAST DAY MINES, Montrose County, U

EAST RIDGE CO

Box 569, Ouray
Pres: Carlton E Byrne
VP: F Moldenhauer
Sec: Alice Davenport
ANDRUS MINE, 14 mi NW of Silverton, undergr, Zn, Pb, Cu, Ag, Au
Gen Mgr: Philip V Doyle
(See Calif)

EGGERS, C F

Dove Creek
DOLORES APRIL MINE, Slickrock dist, San Miguel County, undergr, Prod: 20 tons

ECKMAN, W B

Naturita
U₃O₈ Prod

EMPERIUS MNG CO

Emperius Bldg, Creede
Pres: T B Foxson
Treas: H B Hayden
Gen Mgr: B T Foxson
EMPERIUS MINE (ROBINSON & AMETHYST), 1 1/2 mi N of Creede, undergr, Pb, Zn, Ag, Au, Cu
Mine Supt: T B Foxson
Mine Frm: A M Davis, R R Lehman
Prod: 150 tons
150-TON PLOT MILL, 1 mi S of Creede
Mill Supt: T B Foxson
Assay: Gordon H Axelhus

EQUITABLE URANIUM CORP

327 Cooper Bldg, Denver
Pres: Melvin C Bowles
VP: A L Heflin
Sec: Glenn C Leader, Jr
GOVERNOR MINE & CLAIMS, Box 353, Bishop Canyon, Slick Rock Mng dist, undergr, U₃O₈, V₂O₅
Gen Mgr: Melvin C Bowles
Supt: Vernon K Bowles

ETA MINES

317 Main, Grand Junction
Part: Frank L Seymour, Vernon
Pick & Jim Martin
RAE MARIE MINE, 10 mi W of Gateway, undergr
Mine Supt: James P Martin
Under devel

EUREKA TUNGSTEN CO

3255 S Cherokee St, Englewood
Part: John S Kiefer, E B Ralston
EUREKA MINE, Sugar Leaf mng dist, Boulder County, undergr, WO₃
Gen Mgr: E B Ralston
Idle

FEDERAL URANIUM CORP

215 N 5th, Grand Junction
LARK-LEIGHTON GROUPS, Bull Canyon area, Montrose County
(See Utah)

FIREBOARD PAPER PROD CORP

(Pabco Bldg Materials Div)
1789 Montgomery St, San Francisco
II
OPEN PIT MINE, near Coaldale, Epsom
Gen Mgr: R R Galloway
(See Calif)

FITCHER, OTIS

824 Pine St, Grand Junction
RONNIE #1 MINE, Mesa County, U, V

FIRST NAT'L OIL & MINERAL CO

Box 205, Mancos
GOLD DOLLAR MINE, Montezuma County, Ag, Pb, Zn

FLANDERS MNG CO

(See Pacific Industries, Inc)

JOSIE K FOLSOM MNG & MLO CO, LTD

4280A Holly Ave, St Louis 13, Mo
Pres: Dr C R Curran
VP: -
Sec-Treas: Fred W Kublin
JOSIE K FOLSOM MINE, Saguache County, undergr, Au, Ag, U₃O₈
Gen Mgr: Fred W Kublin
Idle
(See Mo)

FOOTHILLS MNG CO

3240 6th St, Boulder
Pres: C A Wilcox
VP: L F Jonick
Sec-Treas: L B Sweet
Purch Agt: C I Swaaby
WRIGHT LEASE, Idledale, undergr, U₃O₈, V₂O₅
Gen Mgr: C I Swaaby
Asst Gen Mgr: V E Wilcox
Gen Supt: C I Swaaby
Geol: H L Bird
Under devel

FORD URANIUM MINES

Monticello, Utah
U₃O₈ Prod

FORGE HILL TUNNEL

Rt 2, Box 367, Golden
Gen Mgr: Clifford E Morrison
Asst Mgr: W A Horne
FAIRMONT TUNNEL, 1/2 mi SW of Russell Gulch, undergr, Pb, Zn, Ag, Au, Cu, U₃O₈
Under devel

FOSTER, HERBERT

1317 Colorado Ave, Grand Junction
U₃O₈ Prod

FOSTER, RALPH

1317 Colorado Ave, Grand Junction
SNOW SHOE, MESA #5

FOUR CORNERS EXPLOR CO

Petroleum Bldg, Grand Junction
Part: F O Manol, Irving Rapaport, Forrest Fincher
Field Geol: Forrest Fincher
BACHELOR MINE, Box 63, Naturita, U₃O₈, V₂O₅
Prod: 40 tons
Gen Supt: Chess Allmond
(See N Mex)

FOUR CORNERS URANIUM CORP

220 Mile High Center, Denver 2
Pres & Gen Mgr: E H Sanders
VP: E L Clark, A G Rydstrom, J W Gramlich, Sr
Sec-Treas: Tuf Barrow
Cons Eng: C R Witley
Mng Eng: James Baldwin
LYON CREEK & GREEN RIVER MINES, La Sal Canyon Dist, (Matti) La Sal, Utah) U₃O₈, V₂O₅
Gen Supt: Joseph N Trudgeon
BULL CANYON GROUP (S), Bull Canyon Dist
Gen Supt: Joseph N Trudgeon
PALLAORO MINE, Morrison
Gen Supt: Wesley E Smith
Total Prod: 60,000 tons per year
(See Utah, Who and Largo Uranium Corp, N Mex)

FRONT RANGE MINES, INC

Burns Vault Bldg, Denver
Pres & Gen Mgr: John Deeksen
VP: Paul R Spencer, Robt S Mitchell
Sec-Treas: H P Macaulay
MATTIE MINE, Clear Creek County, Pb, Au, Ag, Idle
MELVINA MINE, Boulder County, Au
Idle
STRONG & MARY CASHER MINES, Teller County, Au
KING SOLOMON GROUP
Idle
CLEAR CREEK MILL, Dumont, flat
Capacity: 200 tons

FRONTIER MNG CORP

130 W Main St, Grand Junction
U₃O₈ Prod

FRONTIER OIL & MNG CORP

647 Glenwood Ave, Grand Junction
Pres: Wm J DeMik
Sec-Treas: David Katz
Idle

GADDIS MNG CO

1500 Mile High Center, Denver 8
PROSPECT, W of Vail Pass, Eagle County
Idle
(See Wyo)

GARDNER & CO

P O Box 238, Naturita
U₃O₈ Prod

GARFIELD MINE

Box 209, Salida
Gen Mgr: W E Burleson
Contractor: Carl McMullen
GARFIELD MINE, 20 mi W of Salida, undergr, Pb, Au, Ag
Idle

GARFIELD MINES, LTD

302 Main St, Grand Junction
Pres: John Buxton
VP: P Myers
Sec: Frank Nisley
Treas: J DeVries
FALLS PROPERTY, Rifle, undergr
Geol: G C Ridland
Idle

GAYNO MNG CO

730 N 3rd St, Montrose
U₃O₈ Prod

GENERAL MINERALS CORP

440 Meadows Bldg, Dallas 6, Texas
DISTRICT OFFICE
Petroleum Bldg, Grand Junction
SUMMITVILLE MINE, Box 472, Monte Vista, Co, Au, Ag (Prospect), undergr
Gen Mgr: Dr R V Gaines
Asst Gen Mgr: Robert L Jones
Gen Supt: Royal Serancon
Under devel
(See Texas)

GENERAL RESOURCES LTD

534 Commonwealth Bldg, Denver 2
Pres: W E Roberts
VP: J S Carter
Sec-Treas: Clarence Casiner
Under devel

GERONIMO URANIUM MNG CORP

345 S State St, Salt Lake City, Utah
PARROT GROUP, U₃O₈ Prod
(See Utah)

GIANT CYCLE CORP

Box 96, Carlson Bldg, Colorado Springs
Pres: Merrill E Shoup
Exec VP & Gen Mgr: Max W Bowen
Asst Gen Mgr: G Murray
Sec: H Bates
Treas: John Jacobs, Jr
(See S D)

GIANT RESOURCES, INC

P O Box 1451, Grand Junction
Pres: Donald W Kanaly
VP & Treas: Harold R Babcock
Sec: Clarence Corey
Gen Mgr & Purch Agt: Ed Sirmed
LITTLE DORA & THE EMPIRE MINES, Silverton, undergr, Ag, Pb, Zn, Au
Gen Supt: George Hazen
Geol: Warren Prosser
Mng Eng: Robert L Rock
Prod: 30 tons

GIBALTAR URANIUM & OIL CO

Box 352, Grand Junction
Pres: I W Andrews, Jr
(See Ariz)

GLOBE HILL MNG CO

225A Independence Bldg, Colorado Springs
Pres: H J Anderson
VP: R & Beal
Sec-Treas: R B Murray
Asst Secy: Julia Davison
PHONOLITE MOUNTAIN URANIUM MINE, Cripple Creek, open pit, U₃O₈, Autunite
Asst Gen Mgr: Stan Balcomb
Gen Supt: George West
Geol: T W Anderson
Mech Eng: Lloyd Collard
Asst Mine Supt: L D Anderson
Mine Frm: Earl Hinzah

GLORY HOLE, INC

228 S Washburn Ave, Chicago 4
Pres: Dr W M Muchow
VP-Treas: J Schollerer
CHAIN O'MINES PROPERTY, Central City, open pit, Au, Ag, Pb, Zn, Cu
Gen Supt: Lee Marriot
Mech Eng: Morrison Garriek
Prod: 2,000 tons

GOLD CHIEF MINES, INC

Box 218, Central City
Pres: Maude W Russell
WE GOT EM GROUP, Gilpin County, Ag

GOLD MINES CONSOL, INC

315 Colorado Bldg, Denver
TERRIBLE DUNDERBERG GROUP, Ag, Pb, Zn
Idle

GOLD RANGE, INC

2809 E Colfax Ave, Denver
UTICA GROUP, Boulder County, Au, Idle

GOLDEN COIN MNG CORP

Box 418, Fruita
Op: Carl Losey
Under devel

GOLDEN CYCLE CORP

P O Box 96, Carlson Bldg, Colorado Springs
Pres: Merrill E Shoup
Exec VP & Gen Mgr: Max W Bowen
Asst Gen Mgr: G Murray
Treas: John Jacobs, Jr
Sec: H Bates
Mines Mgr: Charles Carlson
Purch Agt: Howard Bates
ALAX MINE, Cripple Creek, Au
Supt: H Barnett
1,000-TON PLOT-CYAN MELA (Carlton Mill), at mine
Supt: Wm Kleis
URANIUM DIVISION MINE, Atkinson Mesa near Uravan
Supt: T J Ballard
MINE, Marysville
(See Utah)

GOLDEN DAWN URANIUM CORP

243 N 9th W, Provo, Utah
Pres: Roy A Shum
VP: Walter J Eddy
Sec-Treas: Dee Cavin
Purch Agt: Veal S Perry
MINE, Chaffee County, undergr,
U₃O₈, rare earths
Gen Mgr: Verli S Perry
Geol: Roy A Shum
Mine Frm: Joseph V Dodge
Under devel

GOLDEN EAGLE MNG CORP

159 Colorado Ave, Grand Junction
GOLDEN EAGLE MINE, Leadville,
Lake County, Au
Idle

GRAMMICH MINERALS INC

Moab, Utah
U₃O₈ Prod

GREAT BASINS PETROL CO

1515 Mile High Center, Denver 2
Pres: C G Glasscock, Jr
Exec VP: W E Morgan
VP: C L Cavness
Sec-Treas: M H Goforth
KEYSTONE, SANTA MARIE,
RAINBOW MINES, near Dove Creek,
open pit, U₃O₈, V
Geol: Howafo H Odiorne

GREAT FRONTIER MNG CORP

647 Glenwood Ave, Grand Junction
Pres: Wm J Demis
Sec-Treas: David Kats
CEDAR POINT MINE, undergr
Gen Mgr: S P Flybom
Contract Miner: Bert Foster
Idle

GREAT LAKES CARBON CORP

Rosita
ROSITA MINE, Rosita, surface,
perlite
100-TON MILL, Florence
(See Calif, Nev, N Mex, Oreg)

GREAT NORTHERN URANIUM CO

Uranium
U₃O₈ Prod

GREAT WESTERN AGGREGATES, INC

606 Boston Bldg, Denver
Os Ernest W Munroe
GOODWIN QUARRY, surface, gypsum

GREEN RIVER OIL & URANIUM CO

26 W Broadway, Salt Lake City,
Utah
Pres: Falias M Kelly
Sec-Treas: Austin B Smith
VANADIUM QUEEN MINE, San
Miguel County, undergr, U₃O₈
Gen Supt: Richard Dillon
Prod: 4 tons
(See Utah, Wyo)

GREENLEE, W G

Cortez
U₃O₈ Prod

GREENWALD MNG CO

Box 87, Placerville
EL CAPITAN MINE, San Miguel
County, Cu
Idle

GRIPE, WOODROW E (Lessor)

Box 225, Naturita
EARLY MORR, Big Gyp Valley,
undergr, V₂O₅, U₃O₈
Prod: 2 tons
WALLEY'S CLAIM, Slickrock dist,
V₂O₅, U₃O₈
Prod: 10 tons

GULF COAST WESTERN OIL CO

916 Republic Bldg, Oklahoma City,
Oklahoma
DEVEREAUX GROUP, Meeker,
undergr, U₃O₈, V
Supt: R E Miller
Frm: Rex Sterry
Prod: 10 tons
Under devel
(See Okla)

GUM TREE MNG SYNDICATE

c/o E G Robertson, 2360 Cherry St,
Denver
GUMTREE MINE, near Idaho Sprgs,
Au, Pb
Idle

GUNNISON MNG CO

Box 539, Gunnison
Pres: Vance E Thornburg
VP: Dr Garth W Thornburg
Sec-Treas: George M Hill
Purch Agt: William R Johnson
OFF Mgr: Duffy Salinger
LOS OCHOS MINE, approx 23 mi SE
of Gunnison, undergr, U₃O₈
Geol: J G O'Brien
Mine Supt: Leslie C Ross
Asst Mine Supt: P D Koklich
Mine Eng: James Coan
Mine Frm: William R Green
Prod: 135 tons
200-TON MILL, Gunnison
Mill Supt: Cole D Neff
Mill Frm: Wes VanGordon

H & H EXPLOR & ENGR CO

Box 215, 1129 Colorado Ave,
Grand Junction
Pres & Gen Mgr: H J McGarr
VP: Wm C Noonan
Sec-Treas: Gene Day Criesman
PAYROCK, Mesa Cty, undergr,
U₃O₈
Gen Mgr: John Hill
Under devel
(Oper under property management
contract)
150-TON PLOT MILL, at mine

HARDLY ABLE MNG CO

Moab
U₃O₈ Prod

HARTMANN URANIUM CO

1129 Colorado Ave, Grand Junction

HASSELBUSH, RAY & ZIESENHIS, HENRY

Box 481, Rifle
MIDNIGHT MINE, 18 mi NE of
Meeker, undergr, U, V
Undergr prod
Under devel

HERCULES MINING CO

2305 East St, Golden
Pres: Walter H Wahl
VP: LeRoy Westcott
Sec-Treas: Opal Wahl
SUNSET MINE, 4 mi E of Collins
undergr, WO, TL, Ag, Au
Gen Mgr: Walter Wahl
Asst Gen Mgr: LeRoy Westcott
Consult Eng: Dr Arthur Wichmann
Under devel
PLOT MILL (under const)

HERLACHER MNG CO

319 W 3rd, Pueblo
Lessee: Victor C Herlacher
PEERLESS 1, 2, 3 MINES, Custer
County, Cu
Under devel

HETZEL, LEE

Clifton
U₃O₈ Prod

HIDDEN SPLENDOR MNG CO, THE

215 N 5th, Grand Junction
(See Utah)

HI - FI DEVEL CORP

1625 Maple Court Ave, P O Box
1587, Grand Junction
Pres & Gen Mgr: Worth W Offutt
VP: L P Lashness
Sec-Treas: H E Bell
BOC CREEK & BANDY'S SHAMROCK
MINES, approx 3 mi E of La Sal
Junct, undergr, open pit, U₃O₈,
V₂O₅
Geol: Jess Carruthers

HOBBS MNG & DEVEL CO

Box 1273, Hobbs, N Mex
FREELAND EXTENSION, Clear
Creek County, Au
Under devel

HOLDEMAN, E T

Uranium
LONG PARK #6 & #12 MINES, 13 mi
SE of Uranium, undergr, U V
Mine Supt: E T Holdeman
Mine Frm: Calvin O'Bryant

HOLLING, HENRY

P O Box 7, Egner
U₃O₈ Prod

L M HOLLINGSWORTH

Box 187A, Morrison
MADONNA LODGE, Jefferson City

HOLT, HARVEY

Blanding, Utah
U₃O₈ Prod

J M HUBER CORP

P O Box 831, Borger, Texas
U₃O₈ Prod

HUMPHREYS GOLD CORP

910 1st Nat'l Bank Bldg, Denver 2
Pres: A E Humphreys
VP: I B Humphreys
VP: Jay P Wood (Jacksonville, Fla)
VP & Treas: Judson S Hubbard
Sec: W T Hostetter
(See Fla)

HUNT, ALVA

Rt 4 Box 87, Montrose
BELL GROUP, WINDY-DAY GROUP,
Lower San Miguel, undergr, U₃O₈,
V₂O₅
Under devel
(Leased to Page Mng Co, Br of Park
City Consol Mines)

HUNT OIL CO

Grand Junction
URANIUM CLAIMS, San Miguel Cty,
Montrose Cty, U₃O₈
Under devel
RIDDLE LEASES, Paradox Creek,
U₃O₈
(See Utah)

IBEX URANIUM INC

P O Box 556, Montrose
Pres: Theodore L Brooks
VP: Jack R Cagle
Sec-Treas: Stewart C Lee
Geol: Max A Krey
MINES & CLAIMS, Montrose & San
Miguel Counties, undergr, U₃O₈
Under devel
(See Wyo)

IDAHO MARYLAND MINES CORP

Grass Valley, Calif
U₃O₈ Prod
(See Calif, Utah)

IDARADO MNG CO

Ouray
Pres: M D Banghart
IDARADO MINES, 12 mi SW of Ouray
on Red Mt & TELLURIDE MINES at
Pandora, undergr, Cu, Pb, Zn
Gen Mgr: John S Wise
Gen Supt: A C Hillander
Mine Supt: John Kearney
Ch Clerk: Geo C Forbes
Mech Supt: W L Griffiths
Ch Eng: Jack C Keenan
Prod: 1,800 tons
PLOT MILL, Pandora
Supt: M A Jorgensen
Capacity: 40,000 tons ore per mo

INLAND DEVEL CORP

3975 E 58th Ave, Denver 16
Pres: E M Stone
VP: H S Dickson
Sec: C H Launer
Treas: Jan B McDonald
BILL & BUD MINE, Coaldale, open
pit, U₃O₈
Mine Supt: Wm B Harvey
Asst Mine Supt: Wm Ogden
Under devel

INTERNAT'L MINERALS & CHEMICAL CORP

CONSOL FELDSPAR DEPT
20 N Wacker Dr, Chicago 6, Ill
FELDSPAR MILL, Denver
Gen Supt: L W Comer
Prod: 100 tons daily
MICA PLANT, Pueblo, dry grinding
Gen Supt: C M McDaniel
(See Ariz, Fla, Ill, Me, Miss,
N Mex, N C, Okla, Tenn, Va, Wyo)

INTERSTATE MNG & EXPLOR CORP

1036 1st Nat'l Bank Bldg, Denver 2
Pres: S R Mahoney
VP & Treas: L N Seagrave
Sec: W G Dillon
VP: B C Heath
(See Ariz)

IVANHOE TRUST CO

Kokomo
QUEEN OF THE WEST MINE,
Summit County, Au
Mgr: L Deay-Reusch
Idle

JARMAN & HADDEN

P O Box 383, Cortez
U₃O₈ Prod

JEFFREY & ULIDARRI

Montezuma
QUAIL, WATERLOO, NEW YORK
MINES, Summit County

SILVER KING MINE, Summit County

PLYMOUTH MILL
Under devel

JOE DANDY MNG CO

334 Independence Bldg, Colorado
Springs
Acting Pres & VP: Vernon Mitchell
Gen Mgr & Treas: A S Kinselman
Sec: C E Voss
Supt: Harry Allen
JOE DANDY, C O D, COMMON-
WEALTH, HILLSIDE, CLIMAX
VICTORY & SEATTLE MINES,
3-5 mi E of Cripple Creek, undergr,
surface, Au
Idle

JOHNSON BROS & PRIME

Nederland
HOOSIER MINE, WO₃
Under devel

HUGO W JOHNSON & CO

P O Box 257, Nucla
U₃O₈ Prod

JOHNSTON MNG CO

2009 E 6th St, Pueblo
Sec: Eugene C Guild
LITTLE JENNIE MINE, Saguache
County, Cu
Under devel

JONES LEAD & ZINC MINES CO

Box 921, Leadville
Own: Robert L Jones
GARIBALDI MINE, 2 mi E of
Leadville, undergr, Pb, Zn, Au, Ag
Idle
RESURRECTION #2, 2 mi E of
Leadville, undergr, Pb, Zn, Au, Ag
Idle

JOSEPH, ED

Nurwood
U₃O₈ Prod

ROY KAMHOLZ MNG

Egnar
CHARLES T2, T4 MINES, undergr,
U₃O₈, V₂O₅

KANARADO MNG & DEVEL CO

Box 27, Ohio
Pres: Charles Vashua
VP: B V Warren
CARTER MINE, Gunnison Cty, Au, Ag
Under devel
PLOT-AMAL MILL

KELLY, MARK

Naturita
U₃O₈ Prod

KENDRICK BAY MNG CO

Mines Park, Golden
Pres: Frank Coolbaugh
VP: John J Curson
Sec: John P Fitz-Gibbon
Treas: Thomas E Congdon
(See Alaska)

KERR - MCGEE OIL INDUS-TRIES, INC

4931 E 38th Ave, Denver 7
RESEARCH LABORATORY
Mgr: V L Mattson
(See Ariz, N Mex, Okla, Wyo, and
Kermac Nuclear Fuels, Colo, N Mex)

KINGDOM URANIUM & MNG CO

P O Box 266, Aurora 8
Pres & Gen Mgr: Ben J Filla
VP & Treas: N B Filla
Sec: G K Hollingsworth
MINE, open pit, U₃O₈
Under devel

KIRK BASIN URANIUM CORP

3101 Winthrop Ave, Box 9358,
Ft Worth, Texas
AUSTIN MINE, 608 Rood Ave, Grand
Junction, undergr, U₃O₈, V₂O₅
Mng Eng: Francis X Corbett
Prod: 5 tons
(See Texas)

KNIGHT MINING CO

2428 Grove St, Denver 11
NEW YORK MINE, Summit Cty,
Au, Ag, Pb, Zn

KITTIMAC MINING CO

P O Box 541, Silverton
Own: Walter A Bentley
KITTIMAC MINE, 11 mi NE Silverton
in Minnie Gulch, undergr, Ag, Cu,
Pb, Zn, Au
Prod: 8 tons (under devel)

KOSTELIC, LOUIS

203 W 3rd St, Leadville
BI-METALLIC & FREE COINAGE
MINE, Lake City, undergr, Au, Ag, Pb
Prod: 4 tons
20-TON GRAY MILL, Leadville
Mill Supt: Louis Kostelic
Under devel

L & L URANIUM CO

923 1st Nat'l Bank Bldg, Denver 2
EXPLOR & PROP, various parts of
Colo
Idle
(See Wyo)

LBJ MINING CO

P O Box 1085, Rifle
Own: R R Jones, R E Lineker
BREADLINE MINE, Rifle, undergr,
V₂O₅, U₃O₈
Idle

LA GARITA MINES

P O Box 61, La Garita
CRYSTAL BUTTE LODGE, Au
Idle

LAKALUCRE MINES, INC

Box 237, Cortez
URANIUM PROP, Under devel

LAMBERTSON, JOHN

Box 567, Gunnison
STAR MINE GROUP, 35 mi N of
Gunnison, undergr, Pb, Ag

LA SALLE MNG CO

Box 217, Grand Junction
Part: M M Hardin, Roy M Eidal,
G T Rummel, M P Rowe
CLUB MESA MINE, undergr, U₃O₈,
V₂O₅, Uranium
CS-Mgrs: M P Rowe, G T Rummel
Undergr prod
UNDEVEL MNG PROP, various
parts of Colo
(See N Mex, Utah)

**LEAD CARBONATE MINES,
INC**

c/o Henry P Ehringer, Box 186,
Silverton
LEAD CARBONATE MINE, Ag, Pb, Zn
Idle

LEADVILLE LEAD CORP

308 Colorado Bldg, Denver
Pres: Robert G Risk
VP: Harvey Tedrow
Sec: Byron White
Treas: Kenneth Miller
Gen Mgr: James Tiffany
HILLTOP MINES, Fairplay, undergr,
Pb, Zn, Ag, Cu
Under devel

LECLAIR COWS MNG CO

Box 127, Cripple Creek
Gen Mgr: Max W Bowen
MINE, Cripple Creek, Au
Under devel

LEE & SMALL MNG

431 Main St, Montrose
Stewart C Lee, U A Small, 135 S
3rd St W, American Fork, Utah
Geol: Max Krey
MINES & CLAIMS, Montrose &
San Miguel Counties, undergr, U₃O₈
Under devel
(See Utah)

LEHR, VERNON

Gateway
MINE, Calamity Mesa, 17 mi E of
Gateway on Uncompaghe Plateau, U

LE RU MNG CO

Genl Del, Cortez
U₃O₈ Prod

LISBON URANIUM CORP

2909 Hwy 50, Grand Junction
GATEWAY PROPERTIES, Beaver
Mesa, U₃O₈
Contractor: Charles V Woodard
Prod: 750 tons per mo
(See Mont, N Mex, Utah, Wyo)

LISBON VALLEY URANIUM CO

501 Kittredge Bldg, Denver
CHAUTAUQUA MINE, Summit Cty,
Ag, Pb, Zn
MILL, at mine
SILVER PLUME TUNNEL, DIVES-
PELICAN GROUP, RED ELEPHANT
GROUP, Clear Creek Cty, Au, Ag,
Pb, Zn

LITTLE JONNY MINES INC

400 E 4th Ave, Leadville
FANNY RAWLINGS MINE, Lake Cty,
Ag, Pb, Zn
IBEX OPER NO 2, Lake Cty, Au
Idle

**LOST CANYON URANIUM &
OIL CO**

224 First Nat'l Bank Bldg
Albuquerque, N Mex
LOUISE & KATHRYN MINES, undergr
Idle
(See N Mex)

LUCILLE'S URANIUM MINE

#106
Meeker
Pres & Gen Mgr: Rev Willis S Jones
VP: Mrs Nancy Jones
Sec: Max Anna P Richardson
MINE, Meeker, open pit, U₃O₈,
V₂O₅
Mine Supt: Louise Smith
Mine Eng & Asst Supt: Rev W E W Brown
Geol: H E Vits
Under devel

M & M MNG CO

c/o R G McKinley, Buena Vista
LAST CHANCE MINE, Chaffee Cty,
Au
Under devel

M & S INC

Salida
Pres: J W Magnuson
Gen Mgr: R H Magnuson
HOMESTAKE MINE, surface, feldspar

**MAGDALENA MNG & MFG
CO**

P O Box 7425, Denver 15
Pres: W R Jones
VP & Gen Mgr: R M Conrad
Sec-Treas: James C Capen
Asst Sec: E Griesinger
(See N Mex)

MAGIC URANIUM CO

P O Box 58, Moab, Utah
U₃O₈ Prod

MALCO EXPLOR CO, INC

(Formerly Uranium Corp of America)
P O Box 26, Los Alamos, N Mex
S CLAIMS, Lindy Point, Mesa Cty,
near Gateway, U₃O₈
Under devel
(See N Mex, Utah)

**MARKLEY MNG & EXPLOR
CO**

Cripple Creek
Mgr: Lee Brown
TENDERFOOT PROPERTY, Au
Under devel

**MARTINEZ MEDINA &
DOWELL**

P O Box 342, Uravan
U₃O₈ Prod

MARCY-SHENANDOAH CORP

Jarvis Bldg, Durango
Pres: S Stokes Tomlin, Jr
VP: Edward M Barge
Sec: Robert M Schell
Treas: Robert R Snodgrass
GARRY OWEN MINE, Silverton, Ag,
Pb, Zn
SHENANDOAH-DIVES MINE, Silver-
ton, Au, Ag, Pb, Zn
Gen Mgr: S Stokes Tomlin, Jr
(See Ariz, Utah)

**MARY MURPHY GOLD MNG
CO**

Box 209, Salida
Gen Mgr: W E Burleson
Res Mgr: H Van Aken
MINE, 4 mi SW of St Elmo, undergr,
Au, Ag, Pb, Zn
Frm: Henry Carey
Idle
(Leased to W E Burleson)

MAUPIN, ED

Nucla
U₃O₈ Prod

MAY DAY MNG CO

Box 561, Silverton
Mgr: Ennis Cole
MAY DAY MINE, Ag, Pb, Zn
Idle
LUCKY DOG MINE, Uravan

MAYFIELD, JERRY

P O Box 251, Naturita
U₃O₈ Prod

MAYFIELD, PAGE & NEILSON

P O Box 92, Delta
U₃O₈ Prod

**MAYFLOWER MNG &
PETROLEUM CO**

P O Box 528, Ouray
DOUBLEHEADER MINE, Chaffee
County, Ag, Pb, Zn

MCALISTER FUEL CO

P O Box 783, 209 E Wyandotte,
McAlester, Oklahoma
Pres: J O Puterbaugh
VP & Gen Mgr: Tom E Garrard
Sec-Treas: Carl Oman
Geol & Mine Eng: Robert Ford (P O
Box 428, Riverton)
MEEKER MINE, open pit, U₃O₈, V₂O₅
Gen Supt: Ralph Hawks

MCCOY AGGREGATES

1841 St Paul St, Denver
NO NAME CRATER, 5 mi NW of
McCoy

MCCORMICK, WM R

Dove Creek
U₃O₈ Prod
38

McFARLAND & HULLINGER

80 West Vine St, Box 238,
Tooele, Utah
COPPER KING MINE, Route Cty,
Au, Ag, Cu, Pb
(See Ariz, N Mex, Utah)

MAWA MNG CO

4925 Montview Blvd, Denver 7
Pres & Gen Mgr: Joseph W Walsh
VP: M W Walsh
Sec-Treas: Paul L Schmitz
MENA MINE, Golden, Jefferson
Cty, undergr, U₃O₈, Cu, Ag
Gen Supt: R L James
Mine Frm: Golden L Kingery
Geol: A Bird
Prod: 10 tons
PRINCESS OF INDIA MINE, Lawson,
Ag, Pb, Cu, Au, Zn
Prod: 6 tons
Mine Supt: Lee Habcock

**MENDOTA FROSTBURG MNG
CO**

Stockyard Station, Box 6630,
Denver
Pres: D V Watrous
MENDOTA MINE, Clear Creek
County, Ag, Pb, Zn
Idle

MICRO COPPER CORP

Marshall Court, Moab, Utah
Pres: Richard N Mohler
Sec & Treas: Ellis R Cook, Jr
MARTIN MESA & CARPENTER
FLAT MINES, 12 mi N of Uravan,
undergr, U₃O₈, V₂O₅
Gen Supt: Everett Blackburn
Prod: 15 tons

**MID-CONTINENT URANIUM
CORP**

201 Uranium Center Bldg, Grand
Junction
Pres: D Lew Williams
VP & Gen Mgr: Norman E Ehley
Sec-Treas: Mark D Dunn
Purch Agt: John E Danielson
Geol: Coy M Mobley
(See N Mex)

MIDGET MINE CO

Cowdrey
Pres: Walter Symington
MOLYBDENUM NO 1 MINE, Jackson
County, Au
Idle

MILLER, M E

P O Box 17, Placerville
U₃O₈ Prod

**MINERALS CORP OF
AMERICA**

201 N 5th, Grand Junction
(See Utah)

MINERALS ENGR CO

501 Fourth Ave, Grand Junction
Pres: Blair Burwell
VP: R G Sullivan
Sec-Treas: C A Walt
Purch Agt: Ruth Stewart
DIAMOND & WAGON DRILLING
CONTRACTING
(See Mont, N Mex, Utah)

MINES DEVELOPMENT, INC

517 Farmers Union Bldg, Denver
Exec VP: Allen D Gray
Sec-Treas: W H Hoadley
Prod Mgr: G T Bator
Met Consultant: H L Hazen
(See S Dak)

MNG RESEARCH CORP

4215 Balsam St, Wheatridge
Pres: Clifton W Livingston
VP: J Stirling Livingston
Sec: Helen J Livingston
MINE, undergr, surface, U₃O₈
Gen Mgr: C W Livingston
Geol: B M Harnden
Supt: F J Mossman
Under devel
(See S D)

MINING VENTURES

305 Bon Durant Bldg, Salida
VENTURE NO 2, Chaffee County,
WO
Idle

**MOLYBDENUM CORP OF
AMERICA**

Empire
URAD MINE & MILL, undergr, Mo,
MgO
Mgr: John B Carman
Under devel
(See Calif, N Mex, N Y, Pa)

MOLLIE KATHLEEN MNG CO

Cripple Creek
MOLLIE KATHLEEN MINE, Au

**MONOGRAM URANIUM & OIL
CO**

305 Petroleum Bldg, Grand Junction
Pres: Ray Baxter
VP: Howard F Carr
Sec-Treas: George E Ellis
GROUND HOG MINE, Naturita,
undergr, U₃O₈, V₂O₅
Mine Supt: Joseph N Trudgson
Prod: 18 tons
(See Utah)

MONOGRASS URANIUM

Naturita
U₃O₈ Prod

MONTEZUMA URANIUM, INC

Montezuma
c/o Tom E Martin & Patrick J
Vinson
MINE, Collier Min, near Montezuma
U₃O₈ Prod
CHATAQUA MINE & MILL
PAY MASTER MINE
Under devel

MORENO URANIUM CORP

731 Cooper Bldg, Denver
Pres: Dr Edward L Clark
VP: Howard Baisley
Sec-Treas: Ray Bennett
SILVER QUEEN MINE, Silverton, Pb,
Zn, Au, Ag
Idle
LEYDEN URANIUM MINE, Lyden,
U₃O₈
Idle
(See Utah)

MORGAN MINERALS CORP

765 Denver Club Bldg, Denver 2
Pres: Arnold O Morgan
VP: Howard R Gholson
Sec-Treas: H Schleffer
SUNRISE & PATTY MINES, Nucla,
undergr, U₃O₈, V
Gen Mgr: H R Gholson
Supt: James L Capp
Geol: M F Ayler
Prod: 25 tons

**MTN STATES OIL &
URANIUM CO**

738 Univ Bldg, Denver 2
U₃O₈ Prod

**MOUNTAIN STATES URAN-
IUM, INC**

P O Box 7752, Denver 15
Pres & Gen Mgr: James R Mannin,
VP, Treas & Asst Gen Mgr: Peter
Nelson
Sec: Grace Brown
Mine Engr: Paul M Hopkins
BUFFALO #1 MINE, Jamestown,
undergr, U₃O₈
Under devel

MOUNTAIN TOP MNG & MLG CO
159 Colorado Ave., Grand Junction
LEASES, Montrose County, U₃O₈
(See Utah)

NABOB DEVEL CO
812 Majestic Bldg., Denver
Pres: C R Froman
VP: G F Critter
Gen Mgr: Chas O Parker
Sec: E M Stuart
NABOB MINE, 3 mi S of Lawson,
undergr., Ag, Pb, Au, Cu
Supt: Chas O Parker
Under devel

NATIONAL CONSOL MNG CORP
Box 550, Salida
COCOMONGO MINE, Saguache
County, Ag, Pb, Zn
Under devel

NATIONAL LEAD CO, INC
(MEMBER OF NUCLEAR METALS
DIV OF NATIONAL LEAD CO)
Grand Junction
Mgr: R G Vevery
Tech Dir: Charles K McArthur
AEC PILOT PLANT
Plant Supt: W D Charles
Met Eng: Harold Ford, Howard Dixon,
Merle Peters, J R Ruark
Research Eng: Harry Gardner
Mech Eng: J Kalisher
Ch Chem: John Crozier
Acid Plant Frm: Ralph Shimmie
Alkaline Plant Frm: Guy Winslow
Maint Frm: Paul Davis
(See Utah & National Lead Co, N Y)

NATOMAS CO
Fairplay
DREDGE #1, Park County, Au, Ag
Local Supt: Webb Skinner
Idle
(See Calif)

NAVAJO MINERAL FUND INC
323 Fremont St., Las Vegas
Pres, Gen Mgr: J J Sartin
VP: Neilam Hall
Sec-Treas: R Sartin
SMILIN ANN & SHOLOM MINES,
Lake George, undergr., U₃O₈, Pb,
Himestone, allanite
Geol-Mine Eng: R Shoho Douglas
Under devel

NEDERLAND MINES, INC
Office of Sec: 391 Ave of the
Americas, New York, N Y
Pres: Carl Rosen
Exec VP & Sec: G A Norvath
CARIBOU MINE, 1400 Pearl St,
Boulder, 3 mi W of Nederland,
undergr., Ag, Pb, Au
Gen Mgr: Matthew Olsen
Idle
100-TON FLOT MILL, 6 mi E of
Nederland

NEESHAM MNG CO
Nuclea
Gen Mgr: Glenn D Neesham
BUCKSKIN MINE, Bull Canyon,
undergr., U₃O₈, V₂O₅
PEGGIE, Sauer Basin, U₃O₈, V₂O₅
Under devel
RUSTY MINE, undergr., U₃O₈, V₂O₅

NEILSON, CLARENCE L
P O Box 456, Telluride
U₃O₈ Prod

NEPTUNE URANIUM CORP
2835 Walnut St., P O Box 937,
Denver 1
Pres: W E Griffith
VP & Gen Supt: L A Griffith
Sec: Ray Carson
Treas: Fred Burns
SHAMROCKS, KINGPINE & OTHER
MINES, undergr., U₃O₈, V₂O₅
Geol: Paul H Keating
Prod: 1-5 tons
Under devel

NEVADA MINES CO
c/o Walter J Timney, 2008 Pinto
Lane, Las Vegas, Nev
CORA GROUP, Saguache County
Ag, Pb, Zn
Under devel

NEW DOMINION MNG CO
Opale
Mgr: Randolph Bellisle
NEW DOMINION MINE, Oquir, Au,
Ag, Pb
GRAY MILL
Idle

NEW IDRIA MNG & CHEM CO
Idria, California
Pres: C Hyde Lewis
Sec-Treas: M A Burgess
URANIUM DIVISION, P O Box 214,
Getaway, undergr., U₃O₈, V₂O₅
Div Mgr: Arthur W Goring
JOHNNIE MAE MINE, Beaver, Mesa,
undergr., U₃O₈, V₂O₅
PACK RAT, SHAKIN QUACKIE &
HUBBARD HOMESTEAD MINES,
Beaver Mesa, undergr., U₃O₈,
V₂O₅
(Leased to Beaver Mesa Uranium, Inc)
(See Calif & Texas)

NEW JERSEY ZINC CO
EMPIRE ZINC DIV
Gilman
Western Mgr of Mines: Frank J Maloti
Supt, Gilman Oper: W L Jude
Plant Chief: Harold Steinmiller
Personnel: Frank Sherwood
Accountant: Darrell G Barnes
EAGLE MINE, undergr., Pb, Zn
Mine Chief: A M Karwacki
1,200-TON FLOT MILL
Mill Frm: Foster J Witthauer
(See Ill, N J, N Mex, N Y, Pa, Tenn,
Va, Wis)

NEW PENN MINES, INC
Camp Seco
Pres: R F Playter
Sec: J H Nicholls
PENN MINE, 1 mi W of Camp Seco,
Cu, Zn, Ag, Pb, Au
Idle
200-TON FLOT MILL

NEW WORLD EXPLOR.
RESEARCH & DEVEL CORP
Texas Creek
TAYLOR MINE, 10 mi W of Texas
Creek, undergr., U₃O₈
Idle
(See Utah)

NORBUTE CORP
215 N 5th, Grand Junction
VP: DeWitt Deringer
Mgr: Western Mng Div. Abbott Charles
Geol: Kirby C Corryell
(See Utah, Wyo)

NORTH STANDARD MNG CO
Box 605, Provo, Utah
MINE, BULL CANYON, Naturita,
undergr., U₃O₈
Mine Frm: Melvin R Conley
Prod: 13 tons
MILL, Grand Junction
(See Nev, Utah)

**NORTHWESTERN MNG &
PETROLEUM CO**
442 1/2 Main, Grand Junction
Idle

OKAN URANIUM CORP
835 Hall Ave., Grand Junction
U₃O₈ Prod

OLIVERS BROS
Norwood
AMERICAN EAGLE MINE, San
Miguel County, U₃O₈, V₂O₅
OREGON COMPANY
210 Mercantile Bldg., Denver
Pres: C V Liljenquist
Dir-Office Mgr: Sam Milano
HERCULES MINE
JOE & JOHN MINE
HENRIETTA MINE (all) San Juan Cty,
Ag, Pb, Zn
Idle

ORO FINO CONS MINES CO
Box 432, Auburn
Pres: G A Nugent
Treas: J C Kempvance
ORO FINO MINE, 4 mi from Auburn,
undergr., Au, Ag
Idle

ORTMAYER MNG CO
320 S 1st St., P O Box 1840,
Grand Junction
Pres: C G Ortmayer
VP: Hilda Ortmayer
Sec: John Speight
LEGH LEASE, Eggar, undergr.,
U₃O₈, V₂O₅
Gen Mgr: Frank Turman
Mine Frm: W L Ellison

**OTTER CREEK URANIUM
& MNG CO**
OTTER CREEK URANIUM
& MNG CO
Box 186, Silverton
Pres & Gen Mgr: H P Ehrlinger

VP: J F Lacey
Sec: V W Tooley
VALLEY RANCH MINE, undergr.,
U₃O₈, V₂O₅
Undergr: Prod
Idle

OUTLET MNG CO
Box 35, Creede
Pacifi Ag: James M Muir
PHOENIX LODGE, 3 mi N of Creede,
undergr., Pb, Ag, Au
Mine Supt: Gavin W Skinner

OZARK - MAHONING CO
MNO DIV
319 W 6th, Tulsa, Okla &
Nashville, Ill
NORTHGATE MINE, undergr., open
pit, fluor spar, Cowdrey
Gen Supt: R K Wisco
Mine Supt: M P Cloonan
Prod: 325 tons
350-TON FLOT MILL, at Northgate
mine
Mill Supt: Gus Paris
EMMETT & AFTERTHOUGHT MINES,
undergr., fluor spar
Contr: H B Williamson
Prod: 120 tons
120-TON FLOT MILL, at Jamestown
Mill Supt: P H Baker
(See Ill, N Mex, Okla)

PACIFIC INDUSTRIES, INC.
FLANDERS MNG CO (wholly
owned subid)
Box 861, Grand Junction
Pres: Robert E McDonald
VP: William M Spencer
Sec-Treas: Ronald Bailey
GATEWAY MINES, Gateway, undergr.,
U₃O₈
Prod: 25 tons
(See Calif)

PACIFIC URANIUM MINES CO
1924 White, Grand Junction
Pres: B Silbert
Sec-Treas: I Klubok
Ch Geol: R Redmond
(See N Mex)

PAGO MINING CO
Crested Butte
BELL GROUP - WINDY-DAY GROUP,
Lower San Miguel, Head of Big Ope
Valley, undergr., U₃O₈, V₂O₅
Under devel
(Branch of Park City Consol Mines)

PANDORA METALS INC
1555 Dayton St., Aurora
COMSTOCK & PANDORA MINES,
Boulder County, Au
Idle

PARK CITY CONS MINES CO
39 Broadway, Rm 3007, New York 6
Pres & Treas: Carl Stehle
VP: J L Chadwick
Sec: George C Maw
KEYSTONE MINE, Crested Butte,
29 mi N of Gunnison, undergr., Zn,
Pb, Cu, Ag
Gen Mgr: Nolan Probst
Geol: F T Stehle
250 TON FLOT MILL, Crested Butte
(Operated by Amer Smelt & Refin Co,
see Utah)

PARKER MNG & DEVEL CO
421 Glenwood Ave., Grand Junction
Pres: Pierre Parker
BEAN PATCH MINE, Slick Rock,
undergr., U₃O₈
Gen Mgr: Earl B Murray

PASSIFLORA MNG CO
P O Box 749, Canon City
Pres: Charles A Bliley
VP & Gen Supt: M N Taylor
Met: Merle N Shaw
Sec: J D Blunt
PASSIFLORA MINES, 1 1/2 mi W
of Westcliffe, undergr., Ag, Pb, Cu,
Au, U₃O₈
Under devel

PASTORE, JAMES
1846 Walnut St., Coulter
CONGER FLOAT BED, W₃
Idle

PATTERSON, JAMES L
Uravan
U₃O₈ Prod

PENROSE URANIUM CO
701 Midland Savings Bldg., Denver
Pres: F N Bosco
Treas: A C Bosco
URANIUM CLAIMS, various parts
of Colo
Under devel
(See Utah)

PERINI MNG CO
215 N 5th, Grand Junction
Under devel

**PETTIGREW WORLEY &
REYNOLDS MNG CO**
230 W Avery St., Dallas, Texas
U₃O₈ Prod

PHILLIPS, CLAYTON E
P O Box 1175, Rifle
U₃O₈ Prod

**PINNACLE EXPLORATION,
INC**
100 Park Ave., New York 17

Pres: P D Wilson
VP: J T Hall
Sec: A E Davidson
Treas: E A Salo
AKRON MINE, White Pine
Idle
INDIAN CREEK PROSPECT, Gunnison,
undergr., U₃O₈
Gen Mgr: J E Dunn
Gen Supt: R J Flynn
Geol: Dr Arthur Baker III
Under devel
(See N Y)

POLAND & POLAND
P O Box 357, Grand Junction
U₃O₈ Prod

PORTER & CO
P O Box 554, Ivanan
U₃O₈ Prod

**PRAIRIE DIVIDE URANIUM
CO**
231 S Grant Ave., Fort Collins
Pres: T H Sackett
VP: Jas H Andrews
BLACK HAWK #1 & #2, Fort Collins,
undergr., U₃O₈
Idle

PRIDE OF THE WEST, INC
Box 422, Silverton
Agent: C Leslie Larson
PRIDE OF THE WEST MINE, San
Juan County, Zn, Pb, Ag, Au

**PRIME, GEO & JOHNSON
BROS**
Nederland
HOOSIER MINE, Boulder County,
W₃
Idle

PYRAMID URANIUM LTD
608 Road Ave., Grand Junction
Gen Part & Gen Mgr: K Dean Butler
Geol: Fred C Mohne
(See Utah)

RADIUM HILL URANIUM
Nye Bldg., Montrose
Pres & Gen Mgr: Homer Hobbs
VP: Willard Leighton
Sec: Corwin Palmer
(See Utah)

RAINBOW PLACER, INC
2844 Dapew St., Denver
Pres: Dan C Harrington
VP: R V Seaton
Sec: Martha V Keene
PLACERS, Tan Cup, Gunnison Cty,
Au, Ag
Idle

**REALTY URANIUM & MNG
CO, THE**
937 U S Nat'l Bank Bldg., Denver 1
Pres: Frederick W Hand
Sec: David J Clarke
Treas: Chandler Weaver
CALHOUN GROUP, WOOD, BEZANT
MINES, Box 186, Central City,
Gipson County, undergr., Au, Ag, Cu,
Pb, U₃O₈
Supt: Henry Ross
Eng: Ray A Bennett
Idle
(See Utah)

REED, GORDON
Naturita
U₃O₈ Prod

RESURRECTION MNG CO
(Subid of NEWMONT MNG CORP)
Box 936, Leadville
Pres: Fred Searls, Jr
Sec: John E D Grouse
Treas: W F Schmidt
IRENE & JULIA FISK MINES, undergr.,
Pb, Zn, Cu, Au, Ag
Agt: John S Wise
Idle
(See NY & Newmont Mng Corp, NY)

REY URANIUM CORP

Box 1338, Farmington, N Mex
Pres & Gen Mgr: R J Scanlon
ADAK & EQUINOX MINES, Uravan,
undergr., U₃O₈, V₂O₅
Mine Supt: Stan Reed
Prod: 60 tons
(See N Mex)

REYNOLDS MINERALS CORP

1028 1st Nat'l Bank Bldg, Denver 2
Pres: D J Luckhurst
VP & Gen Mgr: C C Ridland
JO REYNOLDS MINE, Lawson,
undergr., Ag, Pb, Zn
Gen Supt: Alexander H Balde
Geol: C C Kugel
100-TON FLOT MILL, Dumont
SMELTER, Leadville
Idle
(See N Y)

REYNOLDS MNG CORP

Poncha Springs
MINE undergr. & Surf, fluorapatite
MILL
Idle
(See Ark, Va)

REYNOLDS TUNGSTEN CORP

1036 1st Nat'l Bank Bldg, Denver 2
DOZIER MINE, Lawson, WO₃
Gen Mgr: C C Ridland
Idle
GRAY MILL

RICO ARGENTINE MNG CO

317 Kearns Bldg, Salt Lake City,
Utah
Pres: Sherman B Hinckley
VP: J C Johnson
Sec: L L Lovell
Treas: B B Hall
Purch Agt: Sherman B Hinckley
MT SPRING & ARGENTINE MINES,
Box 7, Rico, undergr. open pit,
pyrite, Pb, Zn, Ag
Gen Mgr: Sherman B Hinckley
Mine Supt: Paul Bonshart
Mine Frm: R F Leber, Ralph
VanArsdale
Assayer: Charles Tuller
150-TON FLOT MILL, at mine
Mill Supt: Bill Murphy
Assayer: Charles Tuller
1,000-TON PYRITE BENEFIC PLANT
150-TON SULPHURIC ACID PLANT
at mine
(See Utah)

ROBINSON, ELBERT C

Livermore
ROBINSON RANCH MINES, undergr.,
U₃O₈
Prod: 1 ton

ROCKY MOUNTAIN MILL & CHEM CO, (formerly ROCKY MOUNTAIN STANDARD, INC)

Box 187, Boulder
Pres: Howard J Anderson
VP: Hugh Bollinger
Sec-Treas: Charles E Williams
Chm of the Bd: Harry Culver
JOHNSON-WEGAND MINE
URANIUM UPGRADES & OIL
OPERATORS
Under devel

ROSARIO EXPLORATION CO

212 Electric Bldg, Grand Junction
Pres: R M Raininger
VP: H S Anderson
Sec-Treas: G E McDaniel
Geol: Warren E Owe
Explor
Subsid of New York and Honduras
Rosario Mng Co

ROYAL MNG & MLO CO

9th and Harrison, Loveland
c/o Paul H Adams
COWDREY MINE, Boulder City, WO₃

SABRE - PINON CORP

103 Bolam Bldg, Santa Fe, N Mex
Pres: R D Bottom, II
VP: W R Montgomery
Sec: George Glover, Jr
Treas: Hugh M Craigie
URANIUM PROPERTIES, Bull Canyon
dist, Montrose & San Miguel Counties,
Beaver Mesa, Gateway dist, Mesa
City
Explor
(See N Mex)

ST ANTHONY URANIUM CORP

P O Box 1798, Grand Junction
Pres: Frank Coolbaugh
VP & Gen Mgr: A M Mastrovich
Sec: John P Fitz-Gibbon
Treas: Thomas E Congle
URANIUM EXPLORATION N Mex
(See N Mex)

ST REGIS URANIUM CORP

3285 S Jackson St, Denver
Pres: E B Branson
VP: Thomas Kasals
Treas: Neil Horan
Sec: T K Brannan
LONE PINE MINE, Montrose City,
undergr., U₃O₈, V₂O₅
Gen Mgr: E B Brannan
Mine Supt: Delbert Dyer, Lessee
Prod: 15 tons

GEORGE H SAUER

535 Cheyenne Blvd
Colorado Springs
MINE, Boomer Lode, Park Cy, beryl

SALLY BARBER MNG CO

Montezuma
Gen Mgr: Mike Vinson
Asst Mgr: Pat Vinson
CHAUTAUQUA MINE, 5 1/2 mi SW
of Montezuma, undergr., Pb, Ag, Cu
Mine Supt: Fred Harris
Mine Eng: Bill Kejay
Prod: 10 tons
60-TON FLOT MILL, Montezuma
Mill Supt: Mike Vinson
Assay: W H Smith
Under devel

SAMSON URANIUM, INC

501 Sherman St, Denver
Pres: John A Alderman
VP: Vincent Schalm
Sec: Milton Berger
Treas: Robert T Martin
Purch Agt & Gen Mgr: Tom E Martin
See Utah

SAN JUAN LEASING CO

c/o Grover Williams, Uravan
U₃O₈ Prod

SAN JUAN MNG & DEVEL CO

Nederland
Pres: Chas H Turner
VP: Philip F Icke
Sec: Sam D Walter
SAN JUAN MINE Ophir undergr. Cu,
Ag, Pb, Au
Gen Supt: Randolph Belisle
Geol: Dr G C Ridland
Prod: 25 tons, from devel only
Under devel
(Under lease to Cataract Mng Co)

SAN MIGUEL URANIUM INC

230 N 3rd St, Grand Junction
U₃O₈ Prod

SESAME MNG CO

538 1/2 Main, Grand Junction
Under devel

SHATTUCK DENN MNG CO

Box 679, Uravan
Gen Mgr: Thomas W Newell
Gen Supt: Frank W Garrett
Purch Agt: Jack D Hill
SHATTUCK DENN MINE, undergr.,
U₃O₈, V₂O₅
Prod: 75 tons
(See Ariz, N Y)

SHIPROCK INDUSTRIES, INC

2000 Nat'l Bk of Tulsa,
Tulsa, Okla
Pres: F T Anderson
VP: Nels W Stahlheim
Sec-Treas: W Q Clinchy
MINE, Box 461, Boulder, undergr.,
WO₃
Mine Supt: George Jump
Under devel
(See N Mex)

SHUMWAY, LARRY & BOB

Moab, Utah
U₃O₈ Prod

SIERRA ANCHA MNG CO

740 Main St, Grand Junction
(See Ariz)

SILVER BELL MINES CO

633 Quaranty Bank Bldg, Denver 2
Pres & Gen Mgr: E H Sanders
VP: E J Nord
Sec: Jack O Brown
SILVER BELL & CARBONERO MINE,
Ophir, undergr., Au, Pb, Ag, Cu
Gen Supt: Lesley E Smith
Idle

SILVER BULL MNG

771 S Santa Fe, Pueblo
BIG FOUR, Summit County, Au
Under devel

SILVER KING MNG & MLO

ENTRANCES
c/o R L Kahl, 11937 E Colfax Ave,
Denver

**BRIGHTON DUMP, Clear Creek City,
Ag, Pb, Zn
SILVER KING MILL
Idle****SILVER SHIELD MNG & MLO**

CO
704 Newhouse Bldg, Salt Lake
City 1, Utah
Pres: Mary Kyto Ellsworth
VP & Gen Mgr: L E Stein
Sec: Samuel Bernstein
Gen Supt: Phil W Page
MINE, Box 544, Ouray
Idle
250-TON CUSTOM FLOT MILL
(Leased)

SKALLA, A F

Urevas
Gen Mgr: A F Skalla
MONOGRAM MINES, 30 mi S of
Uravan, undergr., U, V
Frm: J R Skalla
PAWN SPRINGS MINE #9 & 12,
undergr., U, V
ANNA MAY & DOG TAIL MINES,
Montrose County, U

SKIDMORE MNG CO

Box 558, Dolores
Pres: T H Skidmore
VP: G H Skidmore
Sec: H S Pack
LEGION GROUP, undergr. U₃O₈, V₂O₅
Asst Gen Mgr: A L Skidmore
(See Utah)

SLAUGHTER EXPLORATION CO

9 Main St, Evansville, Ind
MINE, Box 243, Dove Creek, 15 mi
SW of Dove Creek
Mine Supt & Purch Agt: Wm Barbre
Under devel

SMART, O E

Naturita
U₃O₈ Prod

SMITH & RUGG

Nederland
RAMBLER MINE, Boulder County,
WO₃
Idle

C H SMITH

2000 Marine St, Boulder
QUAKER MINE, Boulder City, WO₃
Idle

SMUGGLER MNG CO

George town
SMUGGLER MINE, Clear Creek
County, Au
Idle

SOUTH MT MNG CO

c/o Frank E Siegfried,
447 Washington St, Monte Vista
GOLD LINKS MINE, Rio Grande
County, Au
Idle

SOUTHWESTERN OIL & URANIUM

El Rio Rancho Motel, Grand
Junction
U₃O₈ Prod
Under devel

SPRAY, EDWIN C

1537 Washington St, Denver 3
SWEET HOME MINE, Alma, undergr.,
Ag, Cu, Pb
Under devel

SPRING DAY MNG CO

Box 388, Central City
Pres & Gen Mgr: William E Landan
Sec-Treas: James R Austin
DAY SPRING & SPRING DAY MINES,
1 1/2 mi SW of Central City near
head of Leavenworth Gulch, undergr.
Geol: Niles Groover
Mine Supt: William E Landan
Asst Mine Supt: Garry Danko
Under devel
42-TON FLOT GRAY MILL, lower
Russell Gulch
Idle

SPRINGER, D P

Naturita
U₃O₈ Prod

STAATS & HIGHTOWER

Naturita
U₃O₈ Prod

STANDARD URANIUM CORP

344 South 4th East, Moab, Utah
Pres & Gen Mgr: Wm R McCormick
VP: Mitchell Mellich
Sec-Treas: I Newton Brown
Purch Agt: James B King

MICAWBER MINE, Crested Butte,
undergr., Pb, Zn, Ag
Asst Gen Mgr: Russell L Wood
Geol: Robert R Ward
Mine Supt: Jack H Dressel
Mine Eng: Charles Carpenter
Under devel
130-TON FLOT MILL, at mine
Under const
MICKEY BREEN & MTN MONARCH
PROPERTIES, Ouray
Mine Frm: Harry J Jordan
Under devel
(See Utah)

STERRY BROTHERS

Meeker
U₃O₈ Prod

STEWART, JAMES

Egnar
U₃O₈ Prod

STRATEGIC MINERALS

EXPLORE CO
P O Box 1448, Grand Junction
Managing Part: John I Schumacher
Oil & Met Dept: H C Anderson
URANIUM EXPLOR, Red Canyon,
East Canyon & LaSal Creek
Under devel

STRATTON CRIPPLE CREEK

MNG & DEVEL CO
Box 178, Colorado Springs
Pres: D P Strickler
VP: H L Stubbs
Sec-Treas: Kenneth Brown
Supt: James H Krenner
MINES, under lease

STURM MINING CO

Rt 12, Box 2536, Grand Junction
Pres & Gen Mgr: Fred Sturm
VP & Purch Agt: Leona Sturm
Sec-Treas: Don R Sturm
Mech Eng: Wesley Sturm
Safety Eng: Lewis Sturm
ELIZABETH GROUP, Mesa Creek,
64 mi SW of Grand Junction, sur-
face, U₃O₈, V₂O₅

SUPERIOR MINES CORP

Salida
Gen Mgr: James Foster-Smith
ANTORO MINE, Box 387, Salida,
undergr., Au, Ag, Pb, Zn, Cu
Idle
(Leased to W E Burleson)

SUSAN B URANIUM CORP

34 Prospectors Lodge, Moab,
Utah
MINES, undergr., surface, U₃O₈,
WO₃
(See Ariz, Utah, Wyo)

SYLVANIA MNG & MLO CO

1114 Security Bldg, Denver
GOLDEN ROSE MINE, La Plata
County, Au

TALL TIMBER MNG CO

c/o L R Hinman, 909 Grant St,
Denver
MINE, near Indian Hills, feldspar,
Ba, Mica, U₃O₈
Under devel

TALLAHASSEE URANIUM

CORP
P O Box 768, Canyon City
U₃O₈ Prod
Idle

TANTALIZER MNG CORP

214 Edgewater Dr, Albany, Ga
TANTALIZER MINE, Fremont
County, Cu
Under devel

TECH SER MNG CO

Box 517, Silverton
LUCKY JACKS GROUP, OSCEOLA
SILVER LEDGE, San Juan County,
Ag, Pb, Zn
Under devel

TERMINAL EXPLOR CO

210 Road Ave, Grand Junction
Under devel

TEXAS - ZINC MINERALS

CORP
620 Road Ave, Grand Junction
Pres: A L Hayes
Mine Ch: R E Radabaugh
Head of Explor: A E Dewch
(See Utah)

Colorado

THOMPSON, WARREN BARRY
P O Box 1837, Denver
GOLD DUST GROUP & INDEPENDENCE MINE, Boulder County, undergr., Au, Ag, Cu
Under devel
(See N Mex, Utah)

THORNBURG MNG CO
140 W Main, Grand Junction

THORNBURG URANIUM MINES, INC.
180 W Main St, Grand Junction
Pres: Vance Thornburg
VP-Sec: Garth Thornburg
Off Mgr: Terry E Weldon
LOS OCHO PROP, Gunnison County, UOg
Producing
(See Utah)

THUNDERBIRD URANIUM CO
P O Box 1845, Salt Lake City, Utah
UOg Prod
(See Utah)

TORRES, DAVID
Monticello, Utah
UOg Prod

TRACE ELEMENTS CORP
UNIT OF UNION CARBIDE NUCLEAR CO

Box 1135, Grand Junction
Pres: Bruce Brownson
VP: C L Walker
Sec: B A Kellogg
MAYBELL MINE & MILL, Maybell, surface, UOg
Gen Mgr: R C Cutter, Geo E Morehouse
Mine Supt: I R Taylor
Plant Supt: K W Lents
Geol: J D Shaw
Met (Consult): John L Chapman
Frm: Don H Seely

TRANS-MOUNTAIN URANIUM CO, INC

2340 Hiway 24, Colorado Springs
Pres: S P Balcomb
VP: Raye L Benham
Sec: Vera M Balcomb
Treas: Howard M Gray
Council: R B Murray
Dir: J A Gerber, C H Long, R D Prigmore
BENHAM MINE, LINDY POINT UNIT, Gateway, undergr., surface, UOg, V
Gen Mgr: S P Balcomb
Asst Gen Mgr: Clyde H Long
Gen Supt: Ted Boothe
Asst Supt: Charley Naught
Under devel

TREASURE MOUNTAIN GOLD MNG CO

202 Midland Savings Bldg, Denver 2
Pres: Guy L V Emerson
Sec: A W Fischer
SANDIAGO, SAN JUAN, QUEEN, GOLDEN FLECK & SCOTIA MINES, 11 mi NW of Silverton, undergr., Au, Ag, Pb, Zn, Mo
Under devel

TREASURY VAULT URANIUM CORP

718 Symes Bldg, Denver
Pres: Ben L Wright, Jr
VP: LeRoy A West
Sec: David J McKee
Treas: Delbert R Peterson
Gen Mgr & Purch Agt: Robert R Hale
Eng: John G Freeman
CHAMPAIGN & CONEY MINES, Fairplay, undergr., UOg
Under devel

TRI - EM CORP

Main Ofc: 924 Cooper Bldg, Denver 2
Oper Ofc: Box 105, Villa Grove
Pres: O R Osmundson
CLIFF & JUPITER MINES, Villa Grove, Au, Ag, Pb, Cu
Gen Mgr: D W Schmidt
Asst Gen Mgr: Joe Osmundson
Mine Supt: F W Burger
50-TON FLOT GRAY MILL, Bonanza, Kerber Creek dist
Mill Supt: Clinton C Anderson
Assayer: John DeVall
Under devel

TRIPLE "O" URANIUM MNG CO

Aspen
Pres: William C Orscheln
VP: Frank Westlake
Treas: Donald W Orscheln
Gen Mgr & Purch Agt: Edwin C Ashar

LOWMECKER MINE, Ashcroft, undergr., Pb, Ag, Cu, Au
Mine Supt: E W Ashar
Idle

TUNGSTEN MNG CO, INC

420 Pine St, Boulder
VP & Treas: George W Cowdery
VP & Sec: William D Cowdery
TUNGSTEN MINE, Boulder, undergr., WOg
Prod: 153 tons in 1957

TURNER, JACK C

P O Box 58, Moab, Utah
UOg Prod

TWIN ARROW PETROLEUM CO

1st Nat'l Bank Bldg, Denver
UOg Prod
Under devel

UNAWEEP C C & H EXPLOR CO

Whitewater
Pres: Jerome Craig, Sr
VP: Don Cox
Sec: Jerome Craig, Jr
Treas: Herschel Hendrickson
Purch Agt: Ralph Craig
MINES, Whitewater, undergr., open pit, placer, V₂O₅, UOg
Idle
MILL, Uravan

UNCOMPANION URANIUM, INC

Box 114, Grand Junction
Pres: John Gaskill
VP: Ken Weaver
Sec-Treas: John Horan
DEER TRAIL MINE, Paxon Creek, 22 mi E of Meeker, undergr.
Supt: Ken Weaver
Under devel

UNION CARBIDE NUCLEAR CO

(A Div of UNION CARBIDE & CARBON CORP)
Electric Bldg, Grand Junction
Gen Mgr Colo Plateau: J L Lake
Mgr of Plants: J F Brenton
Asst Mgr of Plants: H K Jackson
Mgr of Eng: E L Barnes
Mgr of Acct & Finance: C P Martin
Ch Geol: J E Motica
Met: D C Seidel
MINE & MILL, Uravan, undergr., UOg, V₂O₅
Mine Supt: J R Borden
Mill Supt: J M Chandler
Plant Supt: A C Sada
MINE & MILL, Maybell (Trace Elements Corp Unit), open pit, UOg, V₂O₅
Mine Supt: I R Taylor
Plant Supt: K W Lents
MINE & MILL, Slick Rock, UOg
Plant Supt: J P Sanders
Mine Supt: W H Witt
CHEMICAL MILL, Rifle
Plant Supt: H C Peterson
Asst Plant Supt: J W Lane
Mill Supt: M M Brennan
(See Calif, NY, Utah)

UNION GULF OIL & MNG CORP

2701 S Hwy 50, Grand Junction
ST JOHN SILVER MINE, near Montezuma, Summit County
CLAIMS, Saguache County
Idle
(See Utah)

UNITED GOLD MINES CO

Box 127, Cripple Creek
Pres: M E Shoup
VP & Gen Mgr: Max W Bowen
Gen Supt: C H Carlton
VINDICATOR & PORTLAND MINES, Victor, undergr., Au, Ag

U S GYPSUM CO

200 W Adams St, Chicago 6, Ill
QUARRY, Loveland, gypsum, open pit
Works Mgr: J R Miner
(See Calif, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, NY, Ohio, Okla, Tex, Utah, Va)

U S LITHIUM CORP

1205 Walker Bank Bldg, Salt Lake City, Utah
BROWN DERBY & TUCKER MINES, Gunnison County, undergr., lepidolite, spodumene
Gen Mgr: Paul T Walton
(See Utah)

U S SOIL CONDITIONING CO

Rainbow Bldg, Box 246, Salida
Pres: J H Lionelle
TUMBLE MOUNTAIN, surface, gypsum

UNITED URANIUM CORP

1808 Broadway, Denver 2
Pres: Ray Fahlender
VP: Edgar Payton
Sec-Treas: R H Foster
HOT DRILL #11 & PICO #3 MINES, Dove Creek, UOg, V₂O₅
Under devel (lease agreement)

UNIVERSAL OIL & URANIUM CO

1800 W Colfax Ave, Lakewood
RED ELEPHANT GROUP, Clear Creek County, Ag, Pb, Zn
Under devel

URANIUM CORP OF AMERICA

Box 28, Los Alamos, N Mex
FIELD OFFICE, Cortes CLAIMS, Dolores County, Rico area
Under devel

URANIUM DEVEL CORP

Golden
Mgr: Paul Keating
UOg, Under devel

URANIUM ENTERPRISES

2679 Arapahoe, Boulder
Gen Mgr: Elliot Goldstein
MARK #1 MINE, Morrison, undergr., UOg
Mine Supt: Tom Getzer
Prod: 20 tons

URANIUM EXPLORERS SYNDICATE

845 Emerson St, Denver
Gen Mgr: J Brumfield
URANITE, CORVUSITE claims in Mesa and San Miguel counties
Under devel

URANIUM INDUSTRIES INC

132 S 4th, Grand Junction
(See Utah)

URANIUM METALS, INC

Engar
FALCON URANIUM MINE, Bishop Canyon, Montrose County
Ch Eng: Dr A A Zangara
UOg Prod

URANIUM PRODUCERS, INC

Engar
Mgr: Harry E Coppin
URANIUM MINE, Slick Rock dist, Montrose County

URANIUM PROSPECTORS CO, LTD

718 N 5, Grand Junction
UOg, Under devel

URANIUM QUEEN EXPLOR CO

823 1/2 16th St, Greeley
URANIUM QUEEN MINE, Larimer County, UOg
Idle

UTACO URANIUM CORP

Box 113, Moab, Utah
BRADLEY MINE, San Miguel County, Ag, Pb, Zn
SILVER SHIELD MILL, Ouray
Under devel

UTARADO MNG CO

P O Box 287, Montrose
UOg Prod

UTCO URANIUM CORP

310 1st Nat'l Bank Bldg, Denver
Pres: Geo S Casey
VP: Fred C Clymer
Sec: N Clark Thompson
Treas: John AIN
Asst Treas: J D Vander Ploeg
Gen Mgr & Geol: Mason W Rankin
(See Ariz, N Mex, Utah)

UTIDA CO

P O Box 58, Moab, Utah
UOg Prod

VANADIUM CORP OF AMER

Durango
VP & Gen Mgr: D W Viles
MINES, 200 sq mi area on Colorado Plateau, undergr., open pit, V₂O₅, UOg
DURANGO PERSONNEL
Dir of Plateau Oper: Page Edwards
Geol: E E waiters
Master Mech: C T Newland
Mine Eng: Wm W Wittmayer

Lab Supt: Roland G Vesper
Shop Frm: Kenneth Erickson
NATURITA PERSONNEL
Geol: Jack L Benham, Hilary Tanner
Mine Supt: R L Anderson
Master Mech: Frank Sell
Ch Chemist: William Kyle
MILL, Durango, roast leach
Mill Supt: J A Maxwell
Asst Mill Supt: Dale Prior
MILL, Naturita, roast leach
Mill Supt: L A Daniels
Asst Mill Supt: C Don King
(See Ariz, N Mex, N Y, Utah)

VANADIUM QUEEN URANIUM CORP

P O Box 1674, Grand Junction
Pres: Don Danvers
Sec-Treas: Dick Harrison
VANADIUM QUEEN MINE, La Sal Creek, undergr., UOg, V₂O₅
Res Eng: John I Schumacher
Prod: 25 tons
(Oper under contract to Joe Pitts, 133 W Mesa, Grand Junction)

VANURA URANIUM, INC

Marshall Court, Moab, Utah
VP: Ellis R Cook, Jr
Field Supervisor: Everett Blackburn
QUARREL MINE, Bull Canyon, Montrose County, undergr., UOg, V₂O₅
Mine Supt: Lee Elder
CROWN PRINCE, Martin Mesa, Montrose County, undergr., UOg, V₂O₅
(See Utah)

VICON INC

Colorado Springs
Pres: E W Hayes
VP-Gen Mgr: S Carter
Sec-Treas: L H Snyder
Contr: R J Jenkins
DKIE #4 MINE, Clear Creek County, Au
Gen Mgr: F J Dyer
75-TON MILL, Idaho Springs
Mill Supt: Cecil Young

VILLA GROVE TURQUOISE MINE

Villa Grove
LODE, Saguache County, Turquoise

VOGEL URANIUM MINE & EXPLOR CO

Box 3183, Amarillo, Texas
Purch Agt: Harold W Vogel
BLUE BONNET NO 3 MINE, Lake City, undergr., Au, Ag, Zn, Bonite, UOg
Gen Mgr & Mine Supt: Harold W Vogel
Asst Gen Mgr: Harold H Ham
Under devel
(See N Mex)

W A H CHANG CORP

Box 441, Boulder
50-TON GRAY MILL, Sugar Loaf Road, Boulder
Rep in Charge: Earl G Sweeney
10-TON FLOT GRAY MILL, Sugar Loaf Rd, Boulder
(See Calif, Nev & E A Scholz & J H Casler, Ariz)

WALKER ENGINEERING

612 Dooley Bldg, Salt Lake City, Utah
HAF HAZARD MINE, Lake County
Idle
(See Idaho, Utah)

WATERS, MARION R

Rite I, Dolores
UOg Prod

EUSTACE W WEBB

Box 457, Boulder
OPHIR MINE, Boulder County, WOg
WESTERN FELDSPAR MFG CO

Box 671, Salida
Sec-Treas: J W Magnuson
PLANT, near Salida, feldspar
Under devel

WESTERN GOLD & URANIUM, INC

Box 158, St George, Utah
RITO SECO MINE, San Luis, Au
Idle
(See Ariz, Utah)

WESTMINSTER CORP

416-20 1st Nat'l Bank Bldg, Denver
Pres: David W Adams
VP: Melvin C Bowles

FLORIDA

VP & Treas: Jim T Holman
ROC CREEK CLAIMS, Roc Creek
dist, U₃O₈
MINES, Slick Rock Dist, U₃O₈
(See Ariz, Nev, Utah, Wyo)

WILLIAMS MINING CO
Norwood
U₃O₈

C K WILLIAMS
3001 Lynch Ave, East St Louis,
Illinois
Gen Prod Mgr: T J Stewart,
Ophir, Colo

IRON SPRINGS PLACER, crude
iron oxide pigment materials

WORCESTER MINES
1301 White Ave, Grand Junction
MINE, nea. Uravan, undergr,
U₃O₈, V₂O₅
Mng Part: John W Hill
Frmt: Paul R Martin
Shift Boss: Joe G Steckler

WRIGHT BROTHERS
Uravan
PROD CLAIM, Uravan area, U
(Leased to U S Vanadium)

WRIGHT, WARREN
Rt 4, Grand Junction
MINE, 63 mi SW of Grand Junction,
undergr, U₃O₈, V₂O₅

WYCOL MINERALS INC
Saguache
U₃O₈
Idle

YANKEE CANUCK URANIUM
CORP
301 N 5th, Grand Junction
Under devel

YANKEE URANIUM CO
721 Judge Bldg, Salt Lake City,
Utah
U₃O₈
Under devel

YELLOW QUEEN URANIUM
CO
850 Reed St, Lakewood
Pres: T J Danahey
VP: Furnam-Bischof Berger
Sec: R E Robinson
ASCENSION MINE, 5 mi NW Golden,
undergr, U₃O₈
Geol: Dave Coolbaugh

YOUNG CLAIBORNE & YOUNG
3320 N Virginia, Colorado Springs
U₃O₈
Under devel

ZIMMERMAN, BEN
1302 Main St, Grand Junction
U₃O₈ Prod

ZODOMOK MINES, INC
Box 453, Durango
Pres: Karle S Goff
VP: Kenneth Briselden
Sec-Treas: Donald M DeLuche
BESSIE O MINE, undergr, Au, Ag
Prod: 50 tons
50-TON FLOT GRAY MILL,
La Plata Canyon
Mill Supt: Karle S Goff

CONNECTICUT

U S GYPSUM CO
300 W Adams St, Chicago 4, Ill
FALLS VILLAGE MINE, Falls
Village, open pit, limestone
Works Mgr: C P Svehla
(See Calif, Colo, Ill, Ind, Iowa, Mass,
Mich, Mont, Nev, N Mex, N Y, Ohio,
Okla, Texas, Utah, Va)

DELAWARE

E I DU PONT de NEMOURS
& CO
Pigments Dept, 1007 Market St,
Wilmington
(See Fla)

AMERICAN AGRI CHEM CO

Pierce
MINES, Pierce, Polk County,
phosphate rock
Gen Mgr: F R Bergquist
Gen Supt: J S Gruel
Mech Eng: H R Quina
Mine Supt: N M Paulde
FLOT MILL, at mine
(See NY)

AMERICAN CYANAMID CO

30 Rockefeller Plaza, New York 20,
NY
Pres: W B Bell
Sec: W P Sturtevant
Treas: L C Perkins
Dir of Purch: H K LaRoue
Mgr of Phosphate Oper: Arthur Crago
Asst Mgr of Phosphate Oper:

F L McDonald
Mines Mgr: E M Haynsworth
Devel Supt: J L Wegner
Mech Supt: W B Anderson
Met: R C Timberlake
Elec Supt: H L Pace
Ch Eng: W J Pace
ORANGE PARK MINE, Brewster,
Park area, open pit, phosphate
Mine Supt: F A Vogler
Prod: 5,500 tons
ORANGE PARK FLOT MILL
Mill Supt: W F Boyd
6,200-TON SADDLE CREEK FLOT
MILL
Mill Supt: W F Boyd
SYDNEY MINE, Brewster, Acco
area, open pit, phosphate
Mine Supt: C B Duke
Prod: 12,000 cu yds Matrix
3,000 tons phosphate rock
4,400-TON SYDNEY FLOT MILL
Mill Supt: Grady Barnett
(See Ark, Ga, Va)

ARMOUR FERTILIZER
WORKS, INC

Bartow
MINE, Bartow, phosphate

CAMP PHOSPHATE CO

Hernando
Phosphate
Idle

CONTINENTAL MINERAL
PROCESSING CORP

1st Nat'l Bank Bldg, Cincinnati 2,
Ohio
Pres & Gen Mgr: Frederick A Hauck
MINE, Broward County, open pit,
rutile, ilmenite, zircon
Prod: 70 tons
(See Ohio)

CORONET PHOSPHATE CO,
A DIV OF SMITH - DOUGLAS
CO, INC

Box 790, Plant City
Pres: R S Rydell
Sec: W R Mowen
Purch Agt: G W Johnson
TENOROC MINE, Polk County, near
Auburndale, open pit, phosphate rock
Gen Mgr: R M Wilbur
Gen Supt: W H Taylor
Dir Research: C A Hollingsworth
Mine Supt: L G Wood
Mine Eng: E A Sawtuck
FLOT MILL at mine, washing &
screening
Mill Supt: C E Mills

DAVISON CHEMICAL CO
DAVISON CHEMICAL CO
A DIV OF W R GRACE & CO

Florida Phosphate Div
Box 471, Bartow
Gen Mgr: W R Fort
Prod Supt: J D Clary
Mgr, Prod Plan: J L Hunter, Jr
Purch Agt: W W Thornton
Ch Chem: C D McDowell
Ch Eng: A J Frost
Elec Eng: W W Merkel
Geol: E R Schuber
Plant Eng: H W Johnson
Project Eng: C H Greene
Field Eng: T L Nelson
Mines Plan: M P McArthur
Safe Eng: J R Terry
Gen Mines Supt: B P Jones
Phosphate Rock Maint Supt: E J
Purcell
Triple Maint Supt: D W Flieger
Prod: 10,000 tons daily
BOHNY LAKE MINE, Bartow, surface,
phosphate
Supt: W A Allen

PAUWAY #4 MINE, Bartow, surface,
phosphate
Supt: F H Elliott
Chem Plant Supt: D L Brooke
MILL, Ridgewood
Mill Supt: C B Blood
Asst Mill Supt: L L White
ROTARY KILN & DRYERS
(See Md)

E I DU PONT de NEMOURS &
CO

Pigments Dept, 1007 Market St,
Wilmington, Del
HIGHLAND PLANT, (office), Drawer
A, Lawley, & TRAIL RIDGE PLANT,
(office) Drawer 673, Starke
Mgr: Charles A Hager
Met: J C Detweiler
Cont: S I Jackson
HIGHLAND PLANT, 1 mi E of Lawley,
open pit, ilmenite
Supt: E S Beebe
Mine Supt: W C Coran
Mine Eng: J L Hetherington
TRAIL RIDGE PLANT, 6 mi E of
Starke, open pit, ilmenite, zircon,
staurolite
Supt: W J Sippette
Mine Supt: C J Fendrick
Mine Eng: J F Mulling
GRAV MILL
(See Del)

THE FLORIDA MINERALS CO
DIV OF HOBART BROS CO

Box 1597, Vero Beach
Pres & Gen Mgr: N W Van Ausdal
Purch Agt & Gen Supt: Sterling
Dangler
MINE, Winter Beach, open pit,
rutile, zircon, ilmenite
MILL, at mine

FLORIDIN CO

Tallahassee
MINES, Quincy & Jamieson,
surface, fuller's earth
MILLS

HEAVY MINERALS CO

4000 N Hawthorne Ave,
Chattanooga, Tenn
Pres: J C Ward, Jr
VP: E E Wyatt
Sec: K L Karr
Treas: R T Ruder
Gen Mgr: H C Laird
COASTAL SANDS DIV MINE, Box
1097, Panama City, placer, rutile,
ilmenite, zircon, kyanite
Asst Gen Mgr: O G Alessio, Jr
Geol: H H Sahr
Project Eng: G E Aiken
Idle
(See S C, Tenn)

HOWARD PHOSPHATE CO

Box 3028, Orlando
Gen Mgr: R M Howard
MINE, Inverness, surface, 300-ton
bucket dredge, soft, colloidal & hard
phosphate
Mine & Mill Supt: W E Marlow

HUMPHREYS GOLD CORP

Box 5492, Jacksonville 7
VP: J P Wood
JACKSONVILLE PLANT, Box 5492,
Jacksonville, 6 miles E of Jackson-
ville, placer, ilmenite, rutile,
zircon, monazite
Mgr: F McKinley
Supt: H Lewis
Asst Supt: A D Whisler
Eng: J Ellidge
Cont: S L Jackson
(See Colo)

INTERNATL MIN & CHEM
CORP

PHOSPHATE MIN DIV
20 N Wacker Dr, Chicago 8, Ill
Bartow, Fla
PHOSPHATE MINES, Achan,
Noraly, Peace Valley
Prod Mgr: F B Bowen
Mgr: E T Casler
Asst Mgr, Prod: H T Loehr, Jr
Asst Mgr, Eng: W O McClintock
(See Ariz, Colo, Ill, Me, Miss,
N Mex, N C, Ohio, Tenn, Va, Wyo)

KELLOGG CO

820 Franklin St, Ocala
PHOSPHATE MINE

KIBLER - CAMP PHOSPHATE
ENTERPRISE

Box 608, Ocala
Treas: Taylor Scott
Purch Agt: T D Felton
SEC 13 MINE, Dunnellon, open pit,

hard rock, phosphate
Gen Mgr: D B Kibler, Jr
Asst Gen Mgr: Clarence Camp II
Gen Supt: T D Felton
Mine Supt: N T Farrell
Prod: 300 tons

LONCALA PHOSPHATE CO
Box 338, High Springs
PHOSPHATE MINE, Fort White MonaMAGNET COVE BARIUM
CORP

Box 6504, Houston, Texas
MINE, Hinson, open pit, Fuller's
Earth
MILL, 300 tons dry grind
Div Mgr: C L Wilkinson, Jr
Plant Mgr: W C White
Prod Mgr: C F Talbot
(See Ark, Mo, Nev, Texas, Wyo)

RUTILE MNG CO OF FLORIDA

111 Broadway, N Y 6, NY
Pres: Chas C Norris, Jr
VP: John Ross
Sec: J Drezel Paul, Jr
Treas: Peter E Connell
JACKSONVILLE MINE, South Jackson-
ville, open pit, rutile, ilmenite, Zr
Prod: 50,000 tons per yr

SUPERIOR PHOSPHATE CO
Box 476, Dunnellon
PHOSPHATE MINE

SWIFT & CO

Union Stock Yards, Chicago, Ill
BARTOW PHOSPHATE MINE,
Bartow, open pit, phosphate
Gen Mgr: Howard P Gould
Gen Supt: O D Bowers
Mech Eng: W B Hunt
Elec Eng: H K Young
Mine Supt: J B Grant
Asst Mine Supt: E E McKinney
C W Justice

UNITED CLAY MINES CORP

Hawthorne
MINE NO 4, open pit
Mine Supt: L F Sprley
MILL, at mine
(See Ga, Md, N J, Tenn, S C)

VICTOR CHEMICAL WORKS

Tarpon Springs, Fla
155 N Wacker Dr, Chicago 8, Ill
Pres: Rothe Weigel
Purch Agt: M E Jones
ELEMENTAL PHOSPHATE PLANT
Plant Supt: E A Holtgrewe
(See Ill, Mont)

VIRGINIA - CAROLINA CHEM
CORP

Nichols
FLORIDA MNG DEPT, phosphate
Mgr: H L Pascoe
MINES, Clear Springs, Homine
10,000-TON FLOT MILL
(See Tenn, Va)

GEORGIA

ALBEE - YORK MNG CO, INC

Box 356, Cedartown
Pres & Gen Mgr: S B Albee, Sr
VP: Glenn T York, Sr
Sec: Glenn T York, Jr
Asst Gen Mgr & Treas: S B Albee, Jr
Purch Agt: S B Albee, Jr &
S B Albee, Sr
OREMONT MINE, open pit, Fe
Gen Supt: Joe Allen Baker, Jr
Mine Eng: S B Albee, Jr
Prod: 200 tons
500-TON HEAV MED MILL, Oremont

AMERICAN CYANAMID CO

West Bldg, Rome
Mgr: A W Montgomery
NEW HOLLAND MINE, Hermitage,
open pit, bauxite
HOLLOWAY-EASTERLIN MINE,
Andersonville, open pit, bauxite
Geol: R V Shell
MILL, Adairville
(See Ark, Fla, N Y, Va)

AMERICAN TALC CO

Chatsworth
Pres: M W Glenn
VP: F T Glenn
Sec: J R Ferrv
SHOP TUNNEL, 3 mi E of Chatsworth,
talc, soapstone
Prod: 200 tons

Mine Supt: Gerald Swanson
250-TON MILL, Chatsworth
Mill Supt: James Johnston
Mill Frnt: Wm Wauver
(See Ala)

APPALACHIAN MINERALS CO
Box 350, Monticello
VP & Gen Mgr: B C Burgess
MINE, Monticello, feldspar
Ch Eng: L L McMurray
(Subsidiary of Pacific Tia Consol Corp)

ARRINGTON MNG CO
Box 115, Cedarhurst
Own: C B Arrington
MINE, Cedarhurst, Fe

BARTOW MINES, INC
Carterville
Own: Geo Shropshire
IRON MINE, Aubrey

BARTYTES MNG CO
Box 224, Carterville
Pres: A W Wood
MINE, Carterville, barite

CAIN, B R
Box 304, Carterville
MINE, Barite

CLARK & CONNOR
Canton
MINE, Canton, Fe
Mile

CONUTTA TALC CO, THE
Box 524, Dalton
Pres: L F Starr
VP: L B Farrar
Sec & Treas: S A Farrar
Purch Agt & Gen Mgr: Trammell
Blair
FORT MINE, 7 mi E of Chatsworth,
undergr, talc & soapstone
MILL, Chatsworth

COX, J W
Carterville
MINE, Barite

EMPIRE MICA CO
Spruce Pine, NC
Own: S L & J Phillips & Lm Carpenter
BARF MINE, near Barterville

THE FELDSPAR CORP
Box 338, Spruce Pine, NC
FELDSPAR CORP MINE, Monticello,
open pit, gr feldspar
Gen Mgr: Carroll Rogers, Jr
Asst Gen Mgr: P C Coletta
Gen Supt: Ralph Hughes
Met: L L McMurray
Mine Supt: Robt Boone
FELDSPAR MILL, Monticello
Mill Supt: Henry Norman
Flot & dry grinding
Prod: 1,000 tons daily
(Subsidiary of Pacific Tia Consol Corp)
(See HC, Tenn)

GAMMAGE MINING CO
Cedarhurst
Pres: E L Gammage
IRON MINE

GEORGIA MARBLE CO,
CALCIUM PROD DIV
Talc
MINE, Talc, Limestone

GEORGIA TALC CO
Chatsworth
Pres: M Woodward Glenn
MINE, Talc

GRAVES & ACREE MNG CO
Cedarhurst
MINE, 2 mi W of Cedarhurst, Fe
Idle
GRAV MILL

HALE - GEORGIA MINERALS
CORP
Box 197, Carterville
VP & Gen Mgr: Henry Stykal
MINE, Carterville, Fe
Under devel
MINE, Carterville, Mn
Idle

HODGE MINING CO
116 W Cherokee Ave, Carterville
Own: J W Hodge
Sec: M T Shaw
HODGE MINE, 14 mi W of Carterville,
Fe
Supt: Clyde Shaw
Prod: 375 tons
MINE, Barrow County, surface, Fe

KINGMAN MINES, INC
409 College St, Cedarhurst
MINE, on Reynolds Mt between
Cedarhurst & Cave Spr
Mgr: J L Scott

LADD LINE PRODUCTS CO
Carterville
Exec VP: W W Mundy
MINE, Barlow County, Lime
Under devel

LAKE MNG CO, INC
Box 343, Carterville
MINE, Carterville, Fe

LIBERTY GOLD MINE
4822 Blair Circle, Atlanta 18, NE
Own & Op: Leonard Marthin
LIBERTY MINE, Sugar Hill, undergr,
Au, Ag

LIBERTY GOLD MINE
4822 Blair Circle, Atlanta 18, NE
Own & Op: Leonard Marthin
LIBERTY MINE, Sugar Hill, undergr,
Au, Ag
Prod: 15 tons
Under devel

THE MILWHITE CO, INC
P O Box 16438, Houston 28, Texas
Pres: Max B Miller, Jr
VP: F A Frank
Purch Agt: R J Jones
Ch Eng: M M Jamison
MINE, Attaguiga, open pit
150-TON MILL, at mine
(See Tex)

MOSTELLER BROS
Carterville
MINE, Carterville, Fe

NEW RIVERSIDE OCHRE CO
Box 370, Carterville
Managing Part: J R Dellinger
Asst Gen Mgr: W B Hawkins, Jr
MINE, River Road, open pit,
barite, ochre
Gen Supt: John Cobb
Prod: 100 tons

PACIFIC TIN CONSOL CORP
See The Feldspar Corp & Appalachian
Minerals Co

PAGA MNG CO
Carterville
MINE, Carterville, barite

POWHATAN MNG CO
671 Windsor Mill Rd, Baltimore 7,
Md

Pres: Fred A Mett
GAY & CORNELIA MINES, Dillard,
asbestos
Supt: H M Pitts
LANDES MINE, Dillard, open pit,
asbestos
Mine Supt: Frank Burleson
Asst Mine Supt: Coleman Lyday
Prod: 30 tons
(See Md)

SOUTHERN TALC CO
Box 278, Chatsworth
Pres: M Woodward Glenn
MINE, Chatsworth, talc

THOMPSON - WEINMAN & CO
Carterville

UNITED CLAY MINES CORP
Bartonsville
MINE NO 5, open pit
Mine Supt: W J Smith
Asst Supt: Roger M Carlson
MILL, at mine
(See Fla, Md, N J, Tenn, S C)

WILLINGHAM LITTLE STONE
CO

318 Healey Bldg, Atlanta
MINE, Whiteside (large undergr
opening) Dolomite

WOODWARD MINES
Cedarhurst
SHILOH & GEORGIA MINES, Polk
County, Fe
Idle

IDAHO

ADELMONN, A G
632 Idaho St, Boise
BAR PLACER, Au, Ag

ABERDEEN IDAHO MNG CO
890 Rush St, Wallace, Wallace
ABERDEEN-IDAHO GROUP, Shoshone
County, Au, Ag, Cu, Pb, Zn

ADOT MINING CO
Box 1010, Wallace
Pres: Henry L Day
MINE, undergr, Pb, Ag
Idle

ACE URANIUM
Logan, Utah
COPPER QUEEN, GOLDEN COPPER,
COPPER HILL, Lemhi County,
Au, Ag, Cu, Pb, Zn

ALICE SILVER - LEAD MNG
CO
Box 460, Wallace
Pres: O L Jones
Sec-Treas: H F Magnuson
Idle

AMAZON MNG CO
Box 374, Coeur d'Alene
Pres: A E London
Sec-Treas: Geo M Servick
MINE, in Mont, Au, Cu, Ag
Idle
(See Mont)

AMERICAN SILVER MNG CO
123 W 4th Ave, Spokane, Wash
MINE, 1 mi S of Coeur, undergr,
Cu, Au
Under devel by Polaris Mng Co
(See Wash)

AMERICAN SMELTING &
REFINING CO, N W MNG
DEPT

Box 460, Wallace
Mgr: J C Kieffer
Asst Mgr: S E Zelenkov
Supt of Mines: W J Coombe
Supt of Mills: G A Deshler
Elec Supt: A W Beck
Mech Supt: S W Ward
Purch Agt: J P Polla
PAGE MINE, Pb, Zn, Ag
Supt: T M Tower
Asst Supt: C J Ward
Pres: Al Young, Richard James
MORNING MINE, undergr, Pb, Zn,
Ag
Mine Supt: H N Shook
Under devel
1,200-TON MILL
YRECO MINE, Pb, Zn, Ag
Closed 12-31-48
JACK WAITE MINE, Duthie, undergr,
Pb, Zn, Ag
Supt: C H Blackwell
Pres: H F Legault
240-TON MILL, concentrator
(Operated under agreement with Jack
Waite Mining Co)
GALENA UNIT, 3 mi W of Wallace,
undergr, Ag, Pb
Supt: Norman Vines
Mine Supt: G B Christian
Mine Frnt: E Lomas
350-TON MILL, concentrator
Mill Frnt: M Hopkins
(See Volcan & Callahan Zinc-Lead
See Ariz, Calif, Colo, Ill, Kans, Md,
Mont, Neb, N J, N Mex, N Y, Tex,
Utah, Wash & Federal Mng & Smelt-
ing Co, Mo)

ANACONDA CO, THE
35 Broadway, New York 4, NY
Conda, Idaho
Pres: Clyde E Wood
Exec VP: E S McGlone
Sec & Treas: C Earle Moran
VP, Chg West Oper: C H Steele
Gen Mgr, West Mng Oper: A C
Bigley, Butte, Mont
Gen Supt of Mines: A R Simms,
Butte, Mont
Ch Mech Eng: R J Kennard, Butte,
Mont
PHOSPHATE MINE, Conda, open pit,
phosphate rock
Mine Supt: L E Traeger
Mine Frnt: W J Desell
1000-TON CRUSHING, WASHING
& DRYING PLANT, Conda
Mill Frnt: Charles Giles
Assayer: A T Peterson
(See Calif, Mont, Nev, N Mex, N Y,
Utah)

ANDERSON DEVEL CORP
Gimlet
BULLDOG MINE, Ag, Cu, Pb
Idle

ANDERSON, V
800 Idaho St, Sandpoint
OLD TALACHE MINE, Pand Oreille
dist, Bonner County, Au, Ag, Cu,
Pb, Zn

AREHART & CROWDER LEASE
c/o Harley C Arehart, Star Rt
Smelterville
IDAHO GOLDFIELDS, Coeur d'Alene
dist, Kootenai County, Au, Ag, Cu,
Pb, Zn

AUSTIN - MEYER CORP
843 Payton Bldg, Spokane 1, Wash
WEBER MINE, Lakeview dist,
Bonner County, Au, Ag, Pb

BAD BEAR MINE
Habo City
Pres: E L Hreem & Frank G Clement
MINE, Bear Run Road, undergr, Au,
Ag
Prod: 15 tons
15-TON GRAV MILL, at mine

BANNER - IDAHO MINES,
INC
Scott Bldg, Wallace
Pres: John Davis
VP: C W Bentley
Sec-Treas: J W Coomerth
Asst Sec: H F Magnuson
Idle

BAUER, MAX & JESS
HUTCHINSON
Gibsonville
FOREST HILL LOSE, Lemhi Cty,
Au, Ag, Cu, Pb, Zn
Under devel

BAUMHOFF - MARSHALL CO
Big Creek, Cascade Valley
Pres: Fred Baumhoff
Dr Master: Jack Fischer
8-CUBIC-FOOT DREDGE, Big Creek,
Cascade Valley, monazite
Mile
MAGNETIC SEP PLANT, Boise,
monazite, Zr, E, garnet
Supt: Albert H Whitson
Account: Gran Eymen

BATHORSE MINE, INC
Challis
Pres: O J Salisbury
VP & Gen Mgr: W B Swigert
Sec-Treas: O O Langness
BEARDSLEY & RAMSHORN MINE,
15 mi S W of Challis, undergr, Ag,
Pb, Cu
Idle
(Leased from Ramshorn Mines Co)
PACIFIC & FOREST ROSE GROUP,
15 mi S W of Challis, undergr, Pb,
Ag, Zn, Cu, Au
Idle
100-TON GRAV FLOT MILL,
Wayhorse
(Leased from Astma Mng & Invest Co,
Utah)

BEHRENS BROS
Elk City
Mgr: W T Behrens
LITTLE MOOSE CREEK PLANT,
Elk City dist, Idaho County, Au, Ag
Idle

BEHRENS, DONALD E
Elk City
GOLD POINT MINE, Idaho County,
Au, Ag
Idle

BEHRENS, HAROLD E &
LOOSDON, A M
Box 1181, Spokane, Wash
BEHRENS PLACER, Hoodoo dist,
Latah County, Au, Ag

BELL CROSS URANIUM, INC
c/o Virgil S Cross, Jerome
BELL CROSS MINE, Custer County,
U.S.G.
Under devel

BEVERLAND, HARVEY
Box 458, Mackay
Pres: Harvey Beverland
CORN HUSKER MINE, Pb, Ag
Prod: 100 tons per month

BIG EIGHT MNG CORP
Box 1945, Boise
Pres, Gen Mgr & Purch Agt:
A A Creech
VP & Gen Supt: Bob Giest
Sec: Dale Chamberlin
Treas, Asst Gen Mgr & Asst Sec:
Clyde W Creech
Geol & Mine Supt: Dale Creech
BIG EIGHT MINE, Diste, 30 mi NE
of Mt Home, open pit, placer, Ag,
Pb, Au
Under devel

BIG FOUR MINE

Riggins
Opr: Scott & Howard Williams
MINE, Florence & French Creek
dist, Idaho County, Au, Ag, Cu
Idle

BIG IT MNG & MLC CO

7543 Jones Ave NW, Seattle 7,
Wash
Pres: Mrs Fay Kinney
BIG IT MINE, Pine Creek, Smelter-
ville, schellite
Idle
(Under lease to Eberhart & Schmitt-
roth)

BIG SALMON URANIUM INC

881 Main St, Lewiston
Pres: Philip W Jungert
VP: Clyde E Jungert
Sec-Treas: James S Aram
MINE, Riggins, undergr, open pit,
placer, U₃O₈, Pb, Zn, Au
Gen Mgr: Philip W Jungert
Idle

BITTERROOT URANIUM, INC

Salmon
Pres: I J Whitte
VP: John Gunness
Sec: Arthur V Seay, Jr
Treas: Carl A Person
SURPRISE MINE, Gibbonsville,
undergr, surface
Gen Mgr: Merl A Whitte
Geol: George E Summers, Jr
Under devel
800-TON SCREENING MILL
Under const

BLACK BEAR MINE CO

Wallace
BLACK BEAR GROUP, near Gem,
3 mi E of Wallace, Pb, Ag, Au
(Leased to Black Bear Silver-Lead
Mines)
Under devel

**BLACK BEAR SILVER - LEAD
MINES, INC**

Box 847, Wallace
Pres: Geo F Ringel
Sec-Treas: R H Kingsbury
BLACK BEAR GROUP, near Gem,
Shoshone County, Ag, Pb, Zn, Cu
(Leased from Black Bear Mines Co
& being developed by Metropolitan
Mines Corp)
METROPOLITAN GROUP, Shoshone
County, Ag, Pb, Cu
Under devel
(Leased to the Metropolitan Mines
Corp)

BLACK BULL MINE

Ow: Ralph Baumgardner, Boise
E G Peron, Sanger, Calif
MINE, 30 mi E of Salmon, open pit,
Th, U₃O₈
Under devel
(Under lease to Lewis Food Co, 517
E 18th St, Los Angeles 21, Calif)

BRADLEY & ECKSTROM, INC

34 California St, San Francisco 11,
Calif
MINES, variety of minerals
(See Ariz, Calif, Utah)

BRADLEY MINING CO

Bradley Field, Boise
Exec VP: John D Bradley
YELLOW PINE MINE, Stibnite
undergr & open pit, WO₃, Sb, Au,
Ag
Mgt: Edwin Adams
Idle
DMA MINE, Patterson, undergr, WO₃,
Ag, Cu, Pb
Mgt: J A Miller
185-TON GRAV-FLOT MILL,
Patterson
Idle
(See Calif, Nev)

BROUGH, FRED J

Salmon
POPE-SHEWEN MINE, Cu
Idle

BROWN BEAR MINES INC

Parula Bldg, Sandpoint
Pres: Russell Oliver
VP: George Hines
Sec-Treas: A R Nelson
MINE, 7 mi from Segal
Idle

BUCKSKIN MINES, INC

4123 W Holden St, Seattle 6, Wash
BUCKSKIN MINE, Clayton, undergr,
Gen Mgr: J M Menon
Under devel
(See Wash)

BUNKER HILL CO, THE

The Bunker Hill Bldg, 860 Market
St, San Francisco 4, Calif
Pres: John D Bradley
VP: Emmett G Solomon, W Q Woolf,
D L Feathers, R H Cutting, H E Lee
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: Gil Mayes
Mine Mgr: Jos Gordon
Ch Geol: R H McConnell
Mgr, Plant Ser: L M Griffith
BUNKER HILL & CRESCENT MINES,
Box 29, Kellogg, undergr, Pb, Ag,
Zn
Mine Mgr: Joe Gordon
Supt: E B Oide
Ch Mine Assayer: Irving Leskey
Mine Frm: Paul Sloan, Don Wilson,
George Mast, William Coker

Prod: 1,500 tons
2500-TON FLOT CONCENTRATOR,
Kellogg
Mill Supt: Norman J Sather
Asst Mill Supt: J Gordon Craig
Mill Frm: Paul Tietze
LEAD SMELTER, Kellogg
Supt: George Dunn
Asst Supt: Charles Hansen
Ch Research Met: Donald Ingvaldstad
Ch Chem: L W Burgess
Prod: 100,000 tons
ELECTROLYTIC ZINC PLANT,
Kellogg
Supt: Walt Schmittroth
Ch Research Met: Gregory Popoff
Ch Research Chem: Leo Baumstister
Prod: 75,000 tons
STAR MINE, Burks (Operated by con-
tract by Hecla Mng Co)
RED BIRD MINE, Clayton, undergr,
Pb, Ag
(See Wash)

CALERA MINING CO

BLACKBIRD DIV
Cobalt
BLACKBIRD MINE, Cobalt, undergr,
cobalt, Cu, Ni, Au, Ag
Prod: 1,000 tons
Mgt: E B Douglas
Geol: W C Cole
Mech Eng: J P Smith
Mine Supt: K Kuts
Mine Frm: W O Neal
Mine Eng: C J Whitley
1,000-TON FLOT MILL
Mill Supt: C O Hower
Mill Frm: John Vecchies
Assayer: Darrel Smith
(Subst of Howe Sound Co)
(See Utah)

**CAMAS URANIUM MNG &
DEVEL CO**

Gooding
Opr: Donald F Vaught & Lowell Fields
30 CLAIMS, Little Smoky district,
Camas County, undergr, Au, Ag, Pb,
U₃O₈
Under devel

CAMPBELL, WALTER S

West 829 Nora, Spokane, Wash
LUCKY WIN MINE, S fork of Clear-
water Riv, Idaho County, undergr,
U₃O₈
Under devel

CAPITAL SEABOARD CORP

Western Div, P O Box 1847,
Farmington, N Mex
Pres: Jos H Corbin
VP: Chas W Yetter
Sec: Wm A Pope, Jr
Treas: Howard L Corbin
LONG DIKE COBALT MINE, Cobalt,
Lemhi County, undergr, cobalt, Cu
Gen Mgr: C W Yetter
Geol: K E Hamblen
(See Ariz, Mont, N Mex, Utah)

**CAPITOL SILVER LEAD MNG
CO**

Garcon Bldg, Wallace
Pres: H C Mowery
VP: Joe Swan
Sec-Treas: W A Callaway
MINE, Ag, Pb
Under devel

CASTLE, GEORGE

Box 47, Ketchum
EDIES MINE, Blain, Ag, Pb, Zn, Cu
Under devel

CHALLIS VIEW MINE

Challis
Ow: Henry & Ella G Smith
MINE, 8 mi W of Challis, Daugherty
Quich, Ag, Pb
Idle

CHAMPION MINE

Box 281, Mackay
Pres: J L Aulich
MINE, 8 mi S of Mackay, undergr,
Pb, Cu, Ag
Prod: 15 tons crude

CIRC TWINS MNG CORP

Orogrande
Pres: Ross R Brattain, 4011 E Mercer
Way, Mercer Island, Wash
VP: Ottillie H Brattain
Sec-Treas: Mari Brattain
PETSITE MINE, open pit, Au, Cu, WO₃
Gen Supt: Sam Alm
Under devel
FERMAN GROUP, undergr, Au
Idle
CLAIMS, undergr, Au
Idle

CLARKE, EDWARD B

Box 151, Clark Fork
LUCKY OPAL & SURPRISE GROUPS,
3 mi NE of Clark Fork, Pb, Zn
Idle
GREEN MONARCH LEASE, Pb, Ag, Zn
Idle

CLAYTON SILVER MINES

Box 890, Wallace
Pres: W M Yeaman
VP: John Preissner
Sec-Treas: Ray Morrison
CLAYTON SILVER MINES, Clayton,
undergr, Pb, Ag, Zn
Gen Mgr: Norman M Smith
Gen Supt: R J Legard
Mine Supt: Dick Settles
Prod: 105 tons
100-TON FLOT MILL
Mill Supt: James Doyle

CLEARWATER DREDGING CO

218 E Trent, Spokane 2, Wash
Pres: Vernon B Finch
CROOKED RIVER MINE, Elk City,
Idaho County, Au, Ag
Idle

COEUR D'ALENE MINES CORP

203 Gyde Taylor Bldg, Wallace
Pres: H C Mowery
VP: P E Jacobs
Sec: W A Callaway
MINERAL POINT MINE, Osburn,
1 mi S of Osburn, Ag, Cu
Under devel
(Operated by Polaris Mng Co)
600-TON FLOT MILL

COEUR D'ALENE MNG CO

c/o Eugene F McCann, Box 818
Wallace
Pres: T M Reynolds
Sec: Carrie M Fuller
PLACER, 18 mi N of Wallace, Au
Gen Mgr: Eugene F McCann
Idle

**COEUR D'ALENE SILVER
GIANT, INC**

Box 838, Kellogg
Pres & Gen Mgr: Harry G Alway
VP: R E Newman
Sec-Treas: Wayne A Brinard
MINE, E Fork of Big Creek, Kellogg,
Ag, Pb
Idle

**COEUR D'ALENE SILVER
GIANT, INC**

Box 838, Kellogg
Pres & Gen Mgr: Harry G Alway
VP: R E Newman
Sec-Treas: Wayne A Brinard
MINE, E Fork of Big Creek, Kellogg,
Ag, Pb
Under devel

CONJECTURE MINES, INC

338 Wiggert Bldg, Coeur d'Alene
Pres & Purch Agt: Donald E Majew,
421-427 W Third Ave, Spokane, Wash
VP: H E Sandersen
Sec & Treas: Lyle H Funnell
CONJECTURE MINE, Lakeview Ldg
via Bayview, 5 mi SE of Lakeview
Landing, undergr, Ag, Pb, Zn, Cu,
Au, Sb
Gen Mgr: Donald E Major
Asst Gen Mgr & Mine Supt:
Walter H Campbell
Mech Eng: Ernie Williams
Met: Frank Eichelberger, Jr
Asst Mine Supt: Ronald Uts
Prod: 80 tons
Under devel
80-TON FLOT MILL, at mine, Ag
Mill Supt: Frank Eichelberger, Jr
(See Wash)

CONTINENTAL MNG CO

Box 468, Wallace
Opr: E G Peron
MINE, Mackinaw dist, Lemhi County,
Au, Ag, Cu
Ow: Charlie Kapp & Lester Pratt
Under devel

COPPER QUEEN MINE

Salmon
Opr: E G Peron
MINE, Mackinaw dist, Lemhi County,
Au, Ag, Cu
Ow: Charlie Kapp & Lester Pratt
Under devel

CORDERO MNG CO

131 University Ave, Palo Alto, Calif
VP: S H Williams
Gen Mgr: J Eldon Gilbert
WILD HORSE MINE, Mackay, 35 mi
W of Mackay, undergr, Cu, WO₃
Asst Gen Mgr: V P Haas
Gen Supt: Edward Hager
Idle
50-TON GRAV MILL, at mine
(See Calif, Nev, Oreg)

CUBA MINING CO

Wallace
Pres: W H Hanson
MINES, 2 mi from Wallace, Ag, Pb
Idle

DAISY KINGS CLAIMS

Garden Valley
Ow: E W Bowman
CLAIMS, Deadwood Basin, Ag, Au,
Pb, Cu
Idle

DAY MINES, INC

Box 1010, Wallace
Pres & Gen Mgr: Henry L Day
Asst Gen Mgr: Rollin Farmer
Sec: S F Heitfield
Purch Agt: G T Kelton
DAYROCK, MONITOR, TAMARACK,
HERCULES MINES, Wallace, undergr,
Pb, Ag, Zn
Gen Supt: C E Sparks
Prod: 400 tons
4 FLOT MILLS
Mill Supt: L A Grant
1 Mill Idle

DELMAR MNG & MLC CO

N 58th Lincoln, Spokane 18, Wash
Pres: Norman E Mills
VP: Adolph Okert
Sec: Harry O Klaus
MINE, Salmon, undergr, Au, Ag
Mine Supt: Irvin Erickson
Under devel
25-TON GRAV MILL, at mine

DEVIL'S TON DREDGING CO

Shoup
Pres: A P Smothers
Sec: David Hausel
MINE, 29 mi W of Shoup, dragline
placer, Au, rare earth
Idle

DOUGLAS MNG CO

Box 320, Wallace
Pres: Stanley A Easton
VP: Robert E Sorenson
Sec: L E Hill
DOUGLAS MINE, Pine Creek, 13 mi
SW of Kellogg, Pb, Zn, Ag
Idle

DOYLE, JIM

Box 1329, Wallace
AMY MATCHLESS CLEAN-UP MILL
Ag, Cu, Pb, Zn
CONSTITUTION CLEAN-UP MILL,
Shoshone County, Au, Ag, Cu, Pb, Zn
DOUGLAS, HIGHLAND, SIDNEY, &
SURPRISE CLEAN-UP MILLS,
Shoshone County, Ag, Cu, Pb, Zn

DUVALL CO

210 Eccles Bldg, Ogden, Utah
VIRGINIA GROUP, Blackpine dist,
Cassia County, Au, Ag
Idle

**EAST SILVER BELT LEAD
MINES, INC**

Box 885, Wallace
Pres & Mgr: R E Sorenson
Sec: Elton Embom
MINE, Near Mollan, Pb, Zn, Ag
Idle

EASTERN STAR MNG CO

Dishman, Wash
Pres: Ivan Thompson
MINE, Shoshone Cty, Pb
Under devel

EBERT, WALTER

Fernwood
PLACER MINE, St Joe Dist, Benewah
County, Au
Idle

EDAH-HOW URANIUM, INC

Salmon
Pres & Gen Mgr: W W Lowe
Sec: Ed Sargent
EDAH-HOW URANIUM MINE, Salmon,
U.O.
Under devel

ELDO PLACER MNG ASSN

Pierces
Mgr: A J Roeben
ELDO PLACER CLAIMS, Idaho County,
Au, Zr, Monasite, Rhenite, Rutile
Under devel

ELDRIDGE, S S

Birch Creek
WORKING MINE, Lemhi County,
Ag, Pb, Zn, Cu
Idle

ELMQUIST, DON

Peart
MINE, As, Ag, Cu, Pb
Idle

EMPIRE SUN VALLEY MNG CORP

306 Main St, Park City, Utah
Pres: Tom P Costas
Sec: William H Baker
Mgr: Emmett Yaden
CLAIMS, Hailley, Bullion Gulch dist,
Pb, Au, Zn, Ag, U₃O₈
100-TON MILL, Hailley

ENDERLIA, ELMER

Mackay
MINE, Ag, Cu, Pb
Idle

EPP, GEORGE H

1441 San Jose, Compton, Calif
BEAR TRACK #1 & 2, Warren dist,
Idaho County, As, Ag, Cu, Pb, Zn
Under devel

ESKRIDGE, CLAY

Gannett, Idaho
COFFEE POT, Galena dist, Blaine
County, Au, Ag, Cu, Pb, Zn
Under devel

ESTES GOLD MINES, INC

Box 478, Mackay
Pres: C E Lanning
VP: D E Ball
Sec: Peter Scherer
YANKEE PORK MINE, Sunbeam,
undergr, Au, Ag, Cu
Gen Mgr: David E Ball
Prod: 10 tons
60-TON FLOT MILL, at mine
ALTURA MINE, Sunbeam, undergr,
Au, Ag
Idle

EUREKA SILVER-KING MINES CORP

516 First Nat'l Bank Bldg, Boise
SILVER-KING, Valley County, Ag, As
Cu, Pb, Zn
Idle

FAIRFIELD MNG CO, INC

831 E Main St, Stockton, Calif
Pres & Purch Agt: LeRoy A Washburn
VP: Ray Julius
Sec & Treas: F M Lucaccini
ALVA, EL CAMINO & GOAT MT
LODES, Quartz
PRINCETON & ALAMEDA PLACER
CLAIMS, S Fork Boise Riv
Gen Mgr & Mine Frnt: LeRoy
Washburn
Asst Gen Mgr & Mine Supt: Clifton Finley
Met & Mine Eng: Ray Styer
Under devel

FALL CREEK URANIUM CORP, INC

289 10th St, Idaho Falls
Pres & Gen Mgr: I Donald Jerman
Sec: Ralph O Waddoups
CLAIMS, Bonnerville County near
Swan Valley, U.O.
Under devel

FEDERAL URANIUM CORP

P O Box 1317, Salt Lake City,
Utah
CONJECTURE, Bonner County,
As, Ag, Cu, Pb, Zn

FLORENCE BASIN PLACERS

881 Main, Lewiston
Pres: Philip Jungert
VP: Clyde Jungert
Sec: James S Aram
Treas: Marion Jungert
FLORENCE PLACERS, Florence,
placer, As, Pb, Monasite, Zircon,
Titanium
Under devel

FLORIDA MT JOINT VENTURE

Box 1008, Boise
ONTARIO MINE, Carson dist,
Owyhee County, As, Ag
Idle

FRIESTAD, ARNE

Hailley
WESTLAKE GROUP, Blaine County,
Ag, Pb, Zn
Idle

GEM MINES, INC

Warren
THE RESCUE MINE, Idaho County,
Au, Ag
Idle

GEM STATE CONSOLIDATED MINES, INC

3620 Sycamore Drive, Boise
DEWEY GROUP, West View dist,
Gem County, Au, Ag, Cu, Pb, Zn
Under devel

GLANH, EUGENE

Box 104, Bellevue
SCORPION MINE, Little Wood River
dist, Blaine County, Au, Ag, Cu,
Pb, Zn
Under devel

GOLCONDA LEAD MINES

Box 469, Wallace
Pres & Gen Mgr: J A Featherstone
VP & Treas: H F Magnuson
Sec: D H Camp
GOLCONDA MINE, 2 1/2 mi E of
Wallace, undergr, Pb, Ag, Zn
200-TON FLOT MILL, Mullan Rd,
Wallace
Mill Supt: C E Bloom
Asst Mill Supt: Richard Holmberg
Assayer: Peter Mack
Idle

GOLDEN NUGGETT MINES & MLO, INC

Fairfield
Pres & Gen Mgr: Harry T Furrow
VP: Wm Fiacos
Sec-Treas: Mildred Robinson
GOLDEN NUGGETT MINE, Little
Smoky & Carriestown dist, Camas
County, undergr, surface
Under devel

GOLDEN RIDGE URANIUM CO, INC

Box 271, Idaho Falls
Pres: Karl M Pratt
Sec: A A Merrill
Mgr: Joe H Dennis
GOLDEN RIDGE CLAIMS #1 to 13,
Terreton & Roberts, open pit, U₃O₈

GOLDSTONE MNG CO

511 Securites Bldg, Seattle, Wash
Pres & Gen Mgr: B W Porter
VP: Emil Mottman
Sec: F L Mills
GOLDSTONE MINE, Salmon, 21 mi
SE of Salmon, undergr, Au, Cu, Pb
Gen Mgr: Walter Delighton
Geol: Arthur Lakes
Under devel
150-TON FLOT MILL

GRANADA LEAD MINES, INC

Box 257, Wallace
Pres: E G Gnaedinger
VP: R L Roundy
GRANADA MINE, 2 1/2 mi E of
Wallace, Pb, Ag, Zn
Under devel

HAIFNER, DON

Clark Fork
LAWRENCE MINE, Ag, Cu, Pb, Zn

HAILEY TRUST CO

Hailley
MINE, on Camp Creek, U₃O₈
Under devel

HANSY COPPER & GOLD MINES

Box 581, Wallace
Pres: Osa Belaby
VP: Osborne Belaby
Gen Mgr & Purch Agt: Sam Peterson
Sec: Ruby Brown
HANSY MINE, 3 mi SE of Adair,
undergr, Cu, Au, Ag
Under devel

HAROLSON, H L

Shoup
GOLDEN EAGLE PLACER MINE,
Mineral Hill dist, Lemhi Co, Au, Ag

HAYDEN HILL CONS MNG CO

Box 178, 908 W Sprague Ave,
Spokane, Wash
Pres: W G Stratton

VP: J B Phillips

Sec: C C Anderson
Gen Mgr: R R Welderman
PUMIN GROUP, Silver Belt, Coeur
d'Alene
(Leased to Silver Dollar Mng)

HEATH, TED D

Box 117, Fairfield
AUDRY GROUP & BETTY, Soldier
dist, Camas County, Ag, Au
Under devel
MOUNTAIN VIEW GROUP, Skeleton
Creek dist, Elmore County, Au, Ag
Under devel

HECLA MNG CO

Box 320, Wallace
Pres: L J Randall
VP: J L McCarthy & R E Sorenson
Sec-Treas: John R Matthews
Purch Agt: R O Hull
STAR MINE, Burke, undergr, Zn,
Pb, Ag
Mgr, Mines: William H Love
Ch Geol: H E Harper
Mech Eng: Harry Graff
Elec Eng: N Nuhta
Mine Frnt: William Dunphy
Ch Eng: Wallace Crandall
Prod: 800 tons
(Owned by The Bunker Hill Co)
600-TON FLOT MILL, Burke, Zn, Pb
Mill Supt: James Hunter
Mill Frnt: Robert Miller
Assayer: Thomas Hydron
(Sec Utah)

HEISEN, C H

Mackay
McFADDEN MINE, Custer County,
Ag, Pb
Idle

HERMADA MNG CO

Twin Springs
Pres & Mgr: Ernest Oberbiling
VP: Jess Hawley, Jr
Sec-Treas: Carol Oberbiling
HERMADA MINE, 20 mi W of
Atlanta, surface
TALACHE CUSTOM FLOT MILL,
Atlanta
Idle

HESS, GORDON

Box 395, Murray
KLEPFINGER FRACTION PLACER,
Eagle Dist, Shoshone County, As, Ag
Idle

HIGHLAND - SURPRISE CONSOL MNG CO

Box 888, Gode-Taylor Bldg,
Wallace
Pres: Frank J Luedke
VP: Henry C Smith
Sec-Treas: W A Callaway
HIGHLAND-SURPRISE MINE,
Kellogg, 15 mi SW of Kellogg,
undergr, Zn, Pb, Ag
Idle
300-TON FLOT MILL
Idle

HILLTOP MINE

122 S 1st St, Pocatello
Mgr: J E Hamilton
MINE, Lemhi County, Au, Ag, Pb, Cu
Idle

HINES, MARVIN

Sage
BROWN BEAR MINE, Pend d'Oreille
dist, Bonner County, Ag
Under devel

HOLLY MINERALS CORP

340th St N W Albuquerque, N Mex
Pres: A H McRae
VP: J O Heaton
HERMES MINE, Yellow Pine, undergr,
Hg
Geol-Gen Mgr: James C Brassfield
Mine Supt: Art Emerson
Mine Frnt: Jos Phelps
Prod: 200 tons ore
200-TON FLOT MILL, at mine
Mill Supt: Bob Payne
Mill Frnt: Everett Mock
(Sec N Mex, N Y)

HOPE SILVER LEAD MNG, INC

Box 152, Clark Fork
Pres: Glenn C Lee
VP: Ed Groening
Sec-Treas: L F Larson
HOPE MINE, undergr, Pb, Ag, Zn,
Frnt: E T Shields
Eng: Harold Shields
150-TON FLOT MILL
Idle

HORN SILVER MNG & MLO CO

Box 1010, Wallace
Pres: Henry L Day
Sec-Treas: R W Anno
MINES, 3 mi S of Wallace, Ag, Pb, Cu
Idle

HUMPS OF GOLD MINE

Wallace
Own: Lee Earhart & Richard May
MINE, 15 mi E of Orogrande,
undergr, Au, Ag
Idle

HUNGRY HILL MINE

Salmon
MINE, Eldorado dist, Lemhi County,
Au, Ag, Cu

HUNTLEY, JAMES

c/o Grand Hotel, Boise
HAY FORK, Boise Basin dist,
Boise County, Au, Ag, Cu, Pb, Zn
Idle

HYPOTHEEK MNG & MLO CO

510 Bank St, Wallace
VP: Sig Torkelson
Sec & Gen Mgr: Roy H Kingsbury
OIL HYPOTHEEK & KING OF PINE
CREEK MINES, Kingston, Au, Ag, Pb
Idle
(Sec Mont, Utah, Wash & King of
Pine Creek Mng Co, Idaho)

IDAHO - ALTA METALS CORP

Mackay
EMPIRE MINE, Alder Cr dist,
Custer County, As, Ag, Cu, Pb, Zn
(Sec N Y)

IDAHO CONSOL MINES, INC

4109 Arcade Bldg, Seattle, Wash
Pres & Purch Agt: Edmund G Wilson
VP & Treas: Fred J Weirick
Sec: H D Merrick
TWIN PEAKS MINE, Salmon, 18 mi S
of Salmon on U S Hwy 93, undergr,
Pb, Cu, Ag, Au
Gen Mgr: Edmund G Wilson
Gen Supt: H D Merrick
Geol & Mine Eng: Allen C Merritt
Mine Supt & Frnt: H D Merrick
Prod: 125 tons
150-TON FLOT MILL, at mine
Mill Supt: H D Merrick
SMELTER, Salt Lake City, Utah
Under devel

IDAHO - CONTINENTAL MINE

Bonners Ferry
MINE, Port Hill dist, Boundary
County, Ag, Cu, Pb, Zn
Idle

IDAHO CUSTER SILVER-LEAD MINES, INC

Box 469, Wallace
Pres: Alvo V Alvensesben
VP: O O Miller
Sec & Treas: H F Magnuson
LIVINGSTON MINE, 16 mi S of
Clayton, Pb
300-TON MILL

IDAHO GARNET ABRASIVE CO

Fernwood
Own & Op: Lovell Thompson
Asst Mgr: Everett Thompson
Sec: Herschel Tripp
EMERALD CREEK DIGGINGS, 8 mi
S of Fernwood, placer, garnet
Prod: 8,000 tons per yr
100-TON JG & CRUSHING PLANT,
Emerald Cr

IDAHO GOLDFIELDS, INC

737 Peyton Bldg, Spokane, Wash
IDAHO GOLDFIELDS, Coeur d'Alene
dist, Kootenai County, Au, Ag, Cu,
Pb, Zn

IDAHO LAKEVIEW MINES CO

502 Columbia Bldg, Spokane, Wash
Pres & Gen Mgr: J L Drumheller
VP: Kenneth M Howser
Sec-Treas: L R Gordon
Purch Agt & Gen Supt: Earl A McDaniel
LAKEVIEW MINE, Lakeview, undergr,
Ag, Pb, Zn
Idle
KEEP COOL MINE, Lakeview, undergr,
Pb, Ag, Zn, Au, Cu
Idle
60-TON FLOT MILL
Mill Supt: L A Demers
SMELTER, Kellogg

IDAHO MINING COMPANY

Box 888, Kellogg
Pres: C Aubrey Grissom
VP: L E Benson
Sec & Gen Mgr: Bruce E Allgaler
WASHINGTON-IDAHO MINE, W fork,
Moon Creek, 6 mi NE of Kellogg,
undergr, Pb, Zn, Ag, Cu
Idle

IDaho THORIUM CO., INC

Mackay
Pres: J H Stocks
VP: A L Stocks
Sec: Kenneth Deming
MINE, Salmon, undergr & surface
Th, U₃O₈, rare earths
Under devel
MINE, Tunday, surface
Under devel

IDAMONT LEAD-ZINC MINES

CO
S 2323 Lincoln St, Spokane, Wash
Pres: R H Russell
VP: B A Smith
Sec: W B Russell
IDAMONT MINE, Leonia, undergr,
surface & placer
Idle

INDEPENDENCE MINE

c/o J B Eldridge, Placerville
MINE, Big Cr dist, Valley County,
undergr, Ag, Au, WO₃, CaF₂, Sb
Gen Mgr: J B Eldridge
Idle

INDEX - DALEY MINES, INC

21 SW Temple, Salt Lake City,
Utah
INDEX-DALEY MINE, Daise, Elmore
County, Au, Ag, Cu, Pb, Zn
Idle

INSPIRATION LEAD CO

W 909 Sprague Ave, Spokane 4
Wash
Pres: E H Carlson
VP: C C Anderson
Sec-Treas & Gen Mgr: W T
Anderson
Purch Agt & Asst Gen Mgr:
R R Weideman
INSPIRATION LEAD MINE, 304 2 St,
Wallace, undergr,
Gen Supt: R R Weideman
Geol: W H Simons
Mine Supt: Huface Smith
Under devel
(See Utah)

IRON MASK MINING CO

Box 411, Sandpoint
Pres & Purch Agt: George M Watt
VP: R J Evans
Sec-Treas: Robert W Woods
THE IRON MASK MINE, Talache
dist, Bonner County, undergr, Ag,
Au, Cu
Gen Mgr: G M Watt
Geol: Donald Kotschevar
Under devel

IRON MT MNG CO, INC

Box 348, Weiser
Pres: Eugene C Hetrick
VP: John Lloyd
Sec & Treas: Claudia J Merritt
MORTIMER GROUP, 30 mi N of
Weiser, undergr, Pb, Ag, Cu, Zn,
Au
Under devel

ISBELL CONST CO

Box 2351, Reno, Nevada
BLACKBIRD MINE, Cobalt, contract
mng for Calera Mng Co
Supt: Ted Maestretti
(See Ariz, Nev, Utah, Wash)

JACKSON, TOM

Hailey
BARITE LOSE, Blain County, Ag,
Cu, Pb
Idle

JIREH MNG CO

Box 449, Bonners Ferry
IDAHO CONTINENTAL MINE, Ag,
Cu, Pb, Zn
Idle

JOHNSON, CLAIR

Grangeville
JOHNSON MINE, Ten mile dist,
Idaho City, placer, Au, Ag
BIG CREEK MINE, Idaho County,
Au, Ag
Idle

JOHNSON, F A

Pl, Eagle
BLUE RIDGE MINE, Grimes Pass
dist, Boise County, Au, Ag, Cu, Pb
Under devel

JOHNSON, NELS D

8831 NW Springfield, Portland 9,
Oregon
LUCKY DAY, Yankee Fork dist,
Custer County, Au, Ag, Cu, Pb, Zn
Under devel

JONES, E L & ASSOCIATES

P O Box 289, Wiesner
MORTIMER CLAIMS, Washington
County, Pa

JOSUE, A W

Garden Valley
SUNNYSIDE MINE, S Fork Payette
Riv, Boise County, placer, Au, Ag
Idle

KALLAS, SR, JOSEPH F

Box 1719, Boise
MINE, Ada County, Au, Ag
Idle

KANE, CHARLES B

Mackay
BLUE JAY MINE, Cu
Idle

KENISON, BEN V & JESSIE

JOHNSON
Grandview
GEM STATE SILVER, Idaho River
dist, Owyhee County, Au, Ag, Cu,
Pb, Zn
Under devel

KIMBALL, ELROY

Mackay
TURTLE MINE, Custer County, Ag,
Pb
Idle

KING OF PINE CREEK MNG

CO
612 Chronicle Bldg, Spokane, Wash
Pres: C C Anderson
Mgr: W T Anderson
VP: E H Carlson
Sec: L Howe
MINE, Wallace
Idle
(Leased to Hypotheek Mng & Mlg Co)

KITTOCK, JACK

2018 NexPerce St, Boise
MINE, Valley County, Au, Ag
Idle

KUBESH, JAMES E

1622 9th Ave, Sweet Home, Oreg
DUTCH MILL, FREE GOLD MINES,
Pierce dist, Clearwater County, Au,
rare earths, undergr, placer
Gen Mgr: Kenneth White
Under devel
25-TON GRAY MILL, Pierce dist
RETORT FURNACE
(See Oreg)

LAWRENCE CONS MNG CO

Clark Fork
Pres: C I White
Sec: C I White, Jr
LAWRENCE GROUP, Clark Fork,
Pb, Ag, Sb, Zn
50-TON CONC
Under devel

LEAD BLOSSOM MNG & MLG

CO
422 High St, Wallace
Pres: Jerry Gysler
VP: Margaret Denny
LEAD BLOSSOM MINE, Wardner,
undergr, Ag, Pb
Idle

LEESBURG URANIUM, INC

230 N 2nd Ave, Pocatello
Pres & Purch Agt: J E Tarr, Jr
VP: B H Worrell, Salmon
Sec: Leo Munk
Treas & Purch Agt: Don Hansen
MINE, undergr, open pit, placer,
U₃O₈, Pb, Cu, Au, Ag, monazite
Gen Mgr: J E Tarr, Jr
Asst Gen Mgr: Don Hansen
Under devel
MILL, via Salmon, Idaho, Lemhi
County

LEONARD, MRS R H

Silver City via Murphy
DAVIDSON GROUP, 2 mi E of
Silver City, undergr, Au, Ag
Idle
EMPIRE GROUP, 2 1/2 mi E of
Silver City, undergr, Au, Ag
Idle

LEONARD BROTHERS

Silver City via Murphy
Mgr: F L Leonard
Part: Richard M Leonard
PAUPER GROUP, 2 mi SE of
Silver County, undergr, Au, Ag, Cu
2-TON GRAY-AMAL MILL, at mine
Idle

LEONE MARIE MINE

Ovid
Opa: Gambling & Skinner
MINE: Bear Lake dist, Bear Lake
County, Ag, Pb
Idle

LITTLE KLONDIKE MNG CO

3361 S 2nd E, Salt Lake City, Utah
Pres & Gen Mgr: W A Lyman
Sec: Leda Lyman
LITTLE KLONDIKE GROUP, Idaho
City, Elkhorn dist, Au
Agent: T E McDonald
Explor

LITTLE QUEEN MINES, INC

Box 105, Atlanta
Pres: H D Hollenbeck
Sec-Mgr: H M Greenwald
LITTLE QUEEN MINE, Middle Boise
dist, Elmore County, Au, Ag, Pb, Zn,
WO₃

LOOKOUT MT MNG & MLG CO

Box 238, Kellogg
Pres: Wendell R Brainard
VP: Harry G Alway
Sec-Treas: P J Holtz
Under devel

LOUDBROUGH, DON

Roberts
VALLEY VIEW MINE, Clark County,
Ag, Cu
Idle

LUCKY FRIDAY SILVER-LEAD

MINES CO
Box 1131, Wallace
Pres: Chas E Horning
VP & Gen Mgr: John A Featherstone
Sec-Treas: W J Emacio
LUCKY FRIDAY MINE, Mullan,
Hunter dist, Pb, Ag, Au, Cu, Zn
Prod: 150 tons
Mine Supt: David Elder

LUCKY GEM MNG & MLG CO

INC
Box 245, Emmett
Pres: Earl J Adkins
VP: Nan E Adkins
Sec-Treas: Ray N Adkins
LUCKY GEM MINE, open pit, U₃O₈,
Ag, Pb
Under devel

LUCKY SIX MNG CO

Julietta
Pres: Donald Cantril
Sec-Treas: John Longenteig
Gen Supt: Alec McIntosh
Ch Engr: Harold Freeman
455 MINE, 2 mi SW of Clarkie
undergr & placer, Ti, Fe, Au
Idle
41 MINE, Southwick, 6 mi E of
Southwick, undergr & placer, Ti,
Fe, Au
Idle

MACKAY EXPLOR CO

4212 Franklin Rd, Boise
Pres: W P Barton
VP: D E Bell
Sec-Treas: M S Burton
EMPIRE MINE, 3 mi W of Mackay,
Cu, Au, Ag, WO₃
(Leased to Idaho Alta Minerals Corp,
NY)

MARR, FRANK H

611 Payton Bldg, Spokane, Wash
BUNKER HILL (lease), Kellogg,
undergr, Pb, Ag, Zn
Gen Mgr: C F Redding
Mine Frm: Milton Turley
Prod: 50 tons
50-TON FLOT MILL

MASCOT MINES, INC

Box 288, Kellogg
Pres: Malcolm C Brown
VP & Purch Agt: Dunham Bell
Sec-Treas: H F Magnuson
LITTLE PITTSBURGH MINE,
Pine Creek, Kellogg, undergr,
Au, Pb, Ag
Idle
150-TON FLOT MILL, Pine Cr
Idle
(See Utah)

MAYFLOWER GOLD MINES,

INC
Placerville
Pres & Gen Mgr: J B Eldridge
VP: R H Eberle
Sec & Treas: G R Eldridge
MAYFLOWER MINE, 3 mi NW of
Placerville, undergr & placer, Au,
Ag, Zn, monazite, rare earths
Idle

McCLURE BROS

Box 334, Hailey,
McCLURE BROS
c/o H R McClure, Box 334
Hailey
TREASURE VAULT, Mineral Hill
dist, Blaine County, Au, Ag, Cu,
Pb, Zn

MC COY MINE CO

Box 370, Rt 5, Boise
MINE, Box 452, Hailey, 4 mi W & 2
mi S of Hailey, undergr, Au, Ag, Fe
Gen Mgr: Charles H Shepherd
Asst Gen Mgr: W A Shepherd
Under devel
MILL, at mine

McGOWN, A W

Box 137, Challis
POCKET PLACER MINE, Yankee
Fork dist, Custer County, Au, Ag
Idle

McRAE TUNGSTEN CORP

Sibbitt
Pres: R J McRae
VP: Hubert Martin
Gen Supt: Harry M Sargent
SNOWBIRD & RED BLUFF MINES,
Sibbitt, 10 mi W of Big Creek,
Valley County, undergr, Huebnerite,
Scheelite
Mine Supt: James Colliard
Prod: 35 tons
Idle
50-TON FLOT-GRAY MILL, Big Cr

METALINE & PINE CREEK

CONSOL MNG CO
Scott Bldg, Wallace
Pres: Stanley Easton
VP: J M Haffner
Sec: L J Randall
Asst Sec: H F Magnuson

METROPOLITAN MINES

CORP, LTD
510 Bank St, Wallace
Pres & Mgr: Roy H Kingsbury
Sec-Treas: A J Teske
(See Black Bear Silver-Lead Mines,
Ind)

MILBERT, FRANK & M L

DARROW
Box 141, Pottlatch
HOTELING CREEK IRON DEPOSIT,
Latah County, Fe
Under devel

MINERAL RECOVERY &

ENGINEERING CO
Box 476, Wallace
Proprietor: Paul H Floyd
WO₃ UPGRADING PLANT (GRAY
FLOT), Burke Canyon near Gem
Capacity: 20 units WO₃ daily
Idle

MINES, INC, THE

621 N 6, Boise
Pres & Gen Mgr: Ramon S Carlton
VP: Roy Allumbaugh
Sec-Treas: H V Packer
Geol: Robert Charbonneau
B & W #1-2, RITAMAE #1-2-3, 3 mi
W of Bellevue, undergr, Pb, Ag,
Zn, Au
Under devel

MONSANTO CHEM CO

INORGANIC CHEM DIV
Soda Springs
Plant Mgr: R R Rumpner
Prod Supt: W P Dunlap
Maint Supt: F P Hendrickson
Plant Buyer: G F Dupin
BALLARD MINE, 17 mi N of Soda
Springs, open pit, phosphate rock
Mine Supt: R H Crouse
Asst Mine Supt: J A Reeves
Prod: 4,200 tons
MILL, 2 mi N of Soda Springs,
rotary kiln
Mill Supt: R H Crouse
Asst Mill Supt: D L Gillette
ELECTROLYTIC SMELTER, 2 mi N
of Soda Springs
Supt: F C Thomas
Asst Supt: W N Bingham
(See Mo, Tenn)

MONTANA COAL & IRON CO

Washoe, Mont
BLACK PINE MINE, Blackbird dist,
Lemhi County, Ag, Cu
Idle until spring

MOUNTAIN KING MINE

Box 32, Hailey
Mgrs: Fred & Earl Shiris
MINE, Seaford dist, Custer County,
Au, Ag, Cu, Pb, Zn

MOYLE & McCONAUGHEY
712 N 4th St, Sandpoint
KATHERINE, Pond Oreille dist,
Bonner County, Au, Ag, Cu, Pb, Zn
Under devel

MULLAN SILVER - LEAD CO
Scott Bldg, Wallace
Pres: J E McKay
VP: James Doyle, Jr
Sec-Treas: H F Magnusson

NABOB SILVER - LEAD CO
Box 599, Kellogg
Pres: H J Hull
VP, Gen Mgr & Purch Agt: C C Dunkle
Sec-Treas: June H Otson
MINE, Pine Cr, undergr, Zn, Pb
350-TON FLOT MILL
Mill Supt: E M George
Ida

NATIONAL MINES, INC
Box 277, Malad
Pres: W L Baker
VP & Gen Mgr: C A Dye
Sec: Dlythe G Clemens
SENTINEL MINE, 29 mi NE of Howe,
Zn, Pb, Ag
Ida

NATIONAL URANIUM CORP
510 Bank St, Wallace
Pres & Gen Mgr: John T Kingsbury
Sec & Agent: Roy H Kingsbury
CLAIMS, Blaine County, U₃O₈
Under devel

NEW HILARITY MNG CO
Box 27, Spokane, Wash
Pres: R W Neyman
VP: W Brainard
Sec-Treas: E K Barnes
Asst Sec-Treas: E M Bjorjeson
MINE, Box 943, Wallace
Pres: Eugene C Iverson
Ida

NEW RAINBOW MNG CO
647 Payton Bldg, Spokane, Wash
Pres & Treas: Robert B Austin
VP: Orland A Scott
Sec: Marjorie M Tawney
WEDER MINE, Bayview Landing,
Lakeview, Bonner County, undergr,
Au, Ag, Pb
Ida

NORTH FORK MNG CO
Box 469, Wallace
VP: Vernon J Robinson
Sec: Earl Chilcote
MINE, 16 mi N of Wallace
Ida

NORTHWEST MINERALS INC
730 Payton Bldg, Spokane 1, Wash
Pres: Forrest M Garrett
VP: H E Bealy
Sec-Treas: Don A Gillie
HUNTER-CONTINENTAL MINE,
Pinehurst, undergr, Pb, Ag
Gen Mgr: H E Bealy
Geol: M Gratlan Lynch
Ida (assessment work only)
(See Wash)

NORTHWEST URANIUM MINES, INC
Box 1088, Wallace
Pres: F E Scott
VP & Gen Mgr: Clark L Wilson
Sec: Alden Hull
Treas: Jack D Gay
Ida
(See Wash)

OXFORD COPPER MNG CO, LTD
221 First St, Orofino
Pres: A B Curtis
VP, Purch Agt & Gen Mgr:
Robert Ouel
Sec & Treas: Carol Brock
MINE, undergr, Cu
Ida
MILL, near Pierce

PAINTER, MILES L
Box 82, Dixie
ESPERANZA MINE, Orogrande
dist, Idaho County, placer, Au, Ag
Ida

PAYMASTER, INC
611 Peyton Bldg, Spokane 1, Wash
Pres: Frank H Marr
Sec: C D Hamblin
MINE, 31 mi SW of Arco, undergr,
Ida

PENMAN MINE CLAIMS
c/o Ross R Brattain, 7800 SE
2nd Way, Mercer Island, Wash

CLADES, Orogrande 4 mi SE of
Orogrande on Dixie Road, undergr,
Au
Ida
(Leased to Ctrc Twin Mng Corp,
Wash)

PLAINVIEW MNG CO
602 2nd St, Kellogg
Pres & Gen Mgr: S K Garrett
Sec: Charles W Simms
MINE, Osburn
Ida

POLARIS MNG CO
Box 328 Wallace
Pres: L J Randall
VP: George Zeller
Sec-Treas: J R Matthews
Purch Agt: R G Hull
SILVER SUMMIT MINE, 7 mi W
of Wallace, undergr, Ag, Cu
Mgr of Mines: William H Love
Mine Supt: George Grismer
Mine Frm: A P MacDonald
Ch Geol: H E Harper
Prod: 150 tons
300-TON FLOT MILL, Polaris
Mill Supt: J H Hunter
MIL Frm: Wm Bohn
(See American Silver Mng Co, Coeur
d'Alene Mines Corp, Rainbow Mng &
Mlg Co, Ltd)

PORTER BROS CORP
Box 547, 2508 Warm Springs Ave,
Boise
Pres: R P Porter
VP & Sec-Treas: D L Skidmore
Purch Agt: D L Runft
BEAR VALLEY PLACER, at Bear
Valley, Valley County, placer,
columbite, tantalum, uranium,
monazite, rare earths
300-TON GRAV MILL, Lowman
Mill Supt: A L Rose

PRAILS, FRANK
Box 6, Leadore
BROWN BEAR MINE, Lemhi County,
A, Cu, Pb, Zn
Ida

PREMIER STAR MNG CO
Box 123, Osburn
Pres: J A Moore
LUCRETIA CLAIMS, Hunter dist,
Shoshone County
Ida

PRINCETON MNG CO
Scott Bldg, Wallace
Pres: H J Hull
VP: J V Oriamer
Sec-Treas: H F Magnusson
MINE, E of Mullan
Under devel

PROFILE TAMARACK MINES CO
c/o E P Slovay, 309 SW 4th Ave,
Portland, Oreg
Pres: Charles E Thompson
Purch Agt-VP: Henry T Abstein
Sec-Treas: Emil P Slovay
CENTRAL GALENA GROUP, Yellow
Pine, 70 mi NE of Cascade, undergr,
Ag, Pb, Zn, Au
Under devel
(See Oreg)

PUMICE, INC
Box 517, Idaho Falls
Pres: Warren Briggs
VP: C G Wyllie
Sec-Treas: W R Hoops
Plant & Mine Supt: C E Weaver
MINE, 9 mi E of Ammon, surface,
pumice
Geol: V E Carmosini
Prod: 400
MILL, Ammon

RADIORE MNG & EXPLOR CO
Box 68, Milton-Freewater, Oreg
Pres: Earl C Murray
VP: James O Howton
Sec: Henry Kaye
MINE, Mineral Hill Mng dist, Blaine
County
Under devel

RAINBOW MNG & MLG CO LTD
Box 889, Wallace
Pres: H C Mowrey
Sec-Treas: W A Callaway
RAINBOW #1 GROUP, Evolution
dist, Cu, Ag, Pb, Zn
Under devel by Polaris Mng Co

RAMSHORN MINES CO
333 Mt Bldg, Salt Lake City,
Utah
Pres: W W Murray

Sec: Leo Eager
RAMSHORN & BEARDSLEY MINE,
Bayhorse, 70 mi NW of Mackay, Ag,
Pb, Cu
Ida
(Leased to Bayhorse Mines, Inc)

RARE METALS CORP OF AMERICA, NORTHWEST DIV
1st Security Bldg, Salt Lake City 8
Utah
VP: M H Kilne
IDAHO-ALMADEN MINE, Box 637,
Weiser, Washington County, open
pit, Hg
Mine Supt: J J Snider
Off Mgr: Jerry Sugden
Prod: 175 tons
ITS-TON ROTARY KILN MILL,
Weiser
Mill Supt: J J Snider
(See Ariz, Calif, Utah)

RED BIRD MINE
Clayton
Partners: Buchanan, Brechon &
Norden
Gen Mgr: J A Norden
MINE, 8 mi NW of Clayton, undergr,
Pb, Ag
Under devel

RED LEAF GROUP
Halley
Ops: E W Sowers, Stanley Johnson
MINE, Mineral Hill & Camas
dist, Blaine County, Ag, Pb
Ida

RELYEA, GEORGE A
Pierce
RED CLOUD MINES I-10, 8 mi
E of Pierce on Orofino Creek,
undergr, Au, Ag
Mine Supt: George A Relyea
Mine Frm: John Fausner
Ida
(See Mont)

RICHARDSON PLACERS
Box 734 Salmon
Gen Mgr: G E Shoup
Asst Gen Mgr: R M Shoup
PLACERS, 32 mi W of Salmon,
Au, Ag
Under devel

RIPPEN, JOHN
Box 131, Atlanta
HAZEL QUEEN MINE, Logan
County, Au, Ag
Ida

ROBERTSON & STEEPLES
Mackay
GRANDVIEW MINE, Au, Ag, Cu
Ida

RUSTLER MNG CO
835 E 3rd St, Casper, Wyo
RUSTLER MINE, 10 mi SW of
Halley, undergr, Ga, Ag, Zn, U₃O₈
Gen Mgr: Wm T Deacon III
Geol: J H Bright
Ida
(See Wyo)

ST PAUL LEAD CO
c/o James G Fowles, Sidney Bldg,
Kellogg
SNOWSHOE & ST PAUL MINES,
Ag, Pb, Zn
Ida

SALMON RIVER SCHEELITE CORP
Clayton
Pres: Harvey Penney
VP: Larry F Nunnenkamp
Sec-Treas & Gen Mgr: James E
Clutis
Asst Gen Mgr: D P Lemons
TUNGSTEN JR MINE, Clayton,
Thompson Cr, undergr, WO₃
Mine Supt: George Wilcox
Prod: 40 tons
Ida
40-TON GRAV MILL, at mine

SALMON RIVER URANIUM DEVELOP INC
Box 333, Salmon
Pres-Purch Agt: William Wilcox
VP: E A Johnson
Sec-Treas: Mary E Wilcox
MINE, undergr, open pit, U₃O₈,
Th, rare earths
Under devel

SALMON URANIUM & THORIUM CO, INC
Mackay
Pres: P W Frank
VP: Jacob Schank

Sec-Treas: Kenneth H Deming
MINE, Salmon, undergr, surface,
Th, U₃O₈, rare metals
Under devel

SAN FRANCISCO CHEMICAL CO
Manipellier
Pres: D L King
VP: Max L Sprelman & Jerome
Taylor
Purch Agt: Calvin J Sims
WATERLOO MINE, E of Manipellier,
open pit, phosphate
Gen Supt: Charles C Stephens
Mine Supt: Lorraine F Jacobson
(See Utah, Wyo)

SAWLOG MNG
Shoup
Gen Mgr: Magnus Bevan
Sec: Hazel Bevan
TWILIGHT MINE, undergr & surface
Under devel
3-TON GRAV MILL, at mine

SHAWLEY, C F & ANDERSON, V E
Elk City
GOLDEN EAGLE MINE, Dixie dist,
Idaho County, undergr, Au, Ag
Ida

SHERWOOD, RAY
Burley
MINE, Valley County, placer, Au, Ag
Ida

SHUCK, J J
Elk City
SHUCK'S PLACER, Elk City dist,
Idaho County, Au
Ida

SIDNEY MNG CO
103 Sidney Bldg, Kellogg
Pres: M C Brown
Sec-Treas: F E Marler
Gen Supt: C A McKinley
Mech Eng: Zane Smith
Purch Agt: A G Phipps
SIDNEY MINE, 15 mi S of Kellogg,
undergr, Zn, Ag, Pb
Prod: 106 tons
300-TON FLOT MILL, Pine Cr dist
Supt: C A McKinley

SIERRA SILVER - LEAD MINES CO
714 W Shannon, Spokane, Wash
HANDSCRAMBLE GROUP, Osburn,
Shoshone County, Ag, Pb, Cu
Under devel
SISTER, SHOSHONE, & TRAPPER
GROUPS, Osburn, Shoshone County,
Ag, Pb, Zn
Ida

SIGNAL MNG CO
410 Main St, Kellogg
Pres: H G Alway
VP: John B Penney
Sec: Wendell R Brainard
Gen Supt: Eugene C Iverson
HILARITY GROUP, 7 mi W of Kellogg,
undergr, Zn, Pb, Ag
Mine Supt: Eugene C Iverson
Ida

SILVER BUCKLE MNG CO
Box 1088, Wallace
Pres: Dr F E Scott
VP & Gen Mgr: Clark L Wilson
Sec: Alden Hull
Treas: Jack D Gay
SILVER BUCKLE-INDICATOR
PROJECT, Wallace & Mullan, Pb,
Ag
Ida
(See Utah)

SILVER DOLLAR MNG CO
908 W Sprague Ave, P O Box 112,
Spokane 10, Wash
Pres: Elmer E Johnston
VP: L E Nicholls
Sec-Treas: W T Anderson
Purch Agt: W J Carlson
SILVER DOLLAR MINE, Osburn,
undergr, Pb, Ag
Geol: P E Ocasarson
(See Wash & Hayden Hill Cons Mng Co,
Idaho)

SILVER PIRATE MNG CO
P O Box 298, Kellogg
Pres: Donald J Diehl
VP, Purch Agt & Gen Mgr: Albert
M Nash
Sec-Treas: Mary A Nash
SILVER PIRATE MINE, Kellogg
Ida

SILVER STAR MINES

840 Bank St., Wallace
Pres: M D Anderson
Sec: V C Kingsbury
SILVER STAR MINE
Under devel
(See Utah)

SILVER STAR-QUEENS MINES, INC

Box 188, Halley
Pres: Garfield Voget
VP: Edward B Riley
Sec-Treas: J McFadden
Purch Agt: M F Sabala
OLD MINNIE MOORE & QUEEN OF THE HILLS MINES, 1 mi W of Bellevue, undergr, Pb, Ag, Zn
Gen Mgr & Supt: Roy T Pitts
Under devel
(See Walker Eng Corp)

SILVER STILL MNG CO

Welter
Pres: Lee Thorson
VP: Kenneth Steck
Sec: E W Horner
SILVER STILL MINE, Mineral, 30 mi N of Welter, Ag, Cu, Pb, Zn
Idle

SILVER SYNDICATE, INC

Box 1170, Wallace
Pres & Gen Mgr: W M Yeaman
VP: N M Smith
Sec-Treas: Ray Morrison
SILVER SYNDICATE MINE, 10 mi from Wallace, undergr, Au, Cu, Pb, Zn, Ag
Operated by Sunshine Mng Co

SIMI, HUGO A

Cobalt
TIN CUP, Yellow Jacket dist, Lemhi County, Au, Ag, Cu, Pb, Zn

J R SIMPLOT CO

Continental Bank Bldg, Boise
Pres: J R Simplot
VP: W Grant Kilbourne
Treas: John M Dahl
Sec & Atty: Lloyd E Haight
Mgr of Mines: George A McHugh
Staff Geol: Joe Jammott, S A Robinson
Asst Mgr Explor Div: C W Sweet-wood
FERTILIZER DIV, Box 912, Pocatello
Gen Mgr: W Grant Kilbourne
GAY MINE, near Fort Hall, open pit, phosphate
Res Mgr: P T Peterson
Dir Mine Oper: O E Pothier
Mine Supt: Ray Bowden
Mine Eng: John Clauser
Mine Frm: Tom Hughes
Prod: 8,000 tons
FERTILIZER PLANT, Pocatello
Plant Eng: R L Long
Chem Eng: Oscar C Finkelberg
Auditor: William Hahn
FLUORSPAR DIV, Challis
Inactive
(See Mont, Nev, Wyo & Warren Dredging Corp in Idaho)

SMITH, JOHN E

Idaho
WORTHING MINE, Lemhi County, Ag, Cu, Pb, Zn
Idle

SMITH - MURPHY LEASE

151 - 1/2 King St., Wallace
OROPINO DUMP MINE, Sunnits dist, Shoshone County, Ag, Pb, Zn
Idle

SMITH, ARTHUR T

Boise
BUCK CREEK MINE, Elmore County
Columbium, Tantalum

SMOTHERS, A P

Idaho
ELKHORN BAR PLACER, 32 mi W of Shoup, dragline placer, Au, rare earths
Idle
BROKEN HALTER MINE, 50 mi W of Shoup, undergr & surface, CaF₂
Idle

SNOOSE MNG CO

210 N 17th St, Boise
Pres: W F Smith
VP: Mrs A M Jensen
Sec-Treas: R S Bacon
SNOOSE MINE, 1 1/2 mi SE of Halley, undergr, Zn, Pb, Ag
Idle

SOLAR-X-CORPORATION

8045 Ustick Rd, Boise
Pres: Kenneth Arnold
VP: Doyle Symms
Sec: Gus Pearson
STEENS URANIUM MINE, undergr, open pit, U₃O₈
Under devel

SPIDER URANIUM MNG CO

INC
6 Ilex Bldg, Pocatello
VP: Wm E Westergard
CLAMS, Bannock County near Pocatello, Pb, Ag
Idle
CLAIMS, in Utah
(See Utah)

SPOKANE-IDAHO MNG CO

811 Peyton Bldg, Spokane 1, Wash
Pres: Frank N Marr
Sec: C D Randall
Treas: Charles E Marr, Jr
CONSTITUTION MINE, 8 1/3 mi SE of Pinehurst, undergr, Zn, Pb
Idle

SQUAW PEAK MINE

McCall
Partners: F B Frasier, S L Frasier
R J Frasier & A R Roger
MINE, 25 mi N of McCall, undergr & surface, Au, Pb, Zn, Ag, Cu, WO₃, U₃O₈
Supt & Mgr: G W Frasier, Welter
Idle

STRACK, LESTER J

Elk City
CROOKED RIVER MINE, Elk City dist, Idaho County, placer, Au, Ag
Under devel
BLUE MOON MINE, Idaho County, Au, Ag
Idle

SUCCESS MNG CO

Wallace
Pres: Henry L Day
SUCCESS MINE, Wallace, Zn, Pb
Idle

SULLIVAN MNG CO

Bradley
STAR MINE, Hunter Dist, Shoshone County, Ag, Cu, Pb
Under devel

SUNGOLD MINES, INC

711 Hutton Bldg, Spokane, Wash
Pres & Mgr: W T Putman
SUNGOLD MINE, Grangeville, undergr, Au
Idle
(See Wash)

SUNSET LEASE

Day Bldg, Wallace
Gen Supt: R Farmin
SUNSET MINE, 10 mi N of Wallace, undergr, Zn, Pb
Under devel

SUNSET MINES, INC

Box 869, Kellogg
Pres: O Barshahl
VP: David Harvey
Sec: C B Merritt
LIBERAL KING MINE, 11 mi W of Kellogg, undergr, Zn, Pb, Ag, Au
Gen Mgr: R E Lomas
125-TON FLOT MILL, at mine

SUNSHINE CONS, INC

102 Sidney Bldg, Kellogg
Pres: W M Yeaman
VP: Ray Morrison
Sec & Treas: F E Marler, Jr
Gen Mgr: N M Smith
SUNSHINE CONS MINE, 6 mi E of Kellogg, undergr, Ag
(Under devel by Sunshine Mng Co)

SUNSHINE MNG CO

738 Peyton Bldg, Spokane 1, Wash
Pres: Robert M Hardy, Jr
VP: C M Hull
Sec-Treas: Frank M Hardy
Asst Sec: Stanton B Bennett
Asst Treas: Vincent P Whelan
Purch Agt: H J Osborne
Mgr, Mining Div: John Edgar
Mgr, Petroleum Div: A F Wynn
SUNSHINE MINE, Box 1080, Kellogg, undergr, Ag, Pb, Cu, Sb
Mgr: H B Johnson
Ch Geol: James B Colson
Ch Eng: James C Durham
Mise Frm: Charles A Angle
Prod: 150 tons
1,000-TON FLOT MILL
Mtl Supt: Franklin H Sharp

Asst Mill Supt: Leon N Barr
Mill Frm: Lyle Cornell
Antimony Plant Frm: Harold Palmer
SILVER SYNDICATE MINE
(See Silver Syn Mng Co)
SUNSHINE CON MINE
(See Sunshine Cons)
(See Utah & Fairview Placers, Calif)
(See Ariz, Wash)

SUN VALLEY LEAD-SILVER

MINES, INC
Ketchum
Pres: Arthur Swanson
VP: L O Lindberg
Sec-Treas & Gen Mgr: J R Thornton
MINE, undergr
Supt: Fred Lease
Idle
100-TON FLOT MILL, Ketchum
Supt: George Stokes

SUN VALLEY MNG CORP

136 S Locust St, Jerome
Gen Mgr & VP: John Owen
Gen Supt: E A Yaden
Geol: Joe Shipment
Met: Mark G Smerchanski
Sec-Treas: Louise M Lindsey
MINE, Halley, Ag, Au, Zn, Pb
undergr
Mine Supt: Emmett Yaden
Mine Eng: Mark G Smerchanski
Idle
15-TON MILL

TALACHE MINES, INC

1111 Grove St, Box 2088, Boise
Pres: A H Burroughs, Jr
VP: B K Burroughs
Sec: W A Griffin
BOISE-ROCHESTER, MORARCH & LAST CHANGE MINES, Morarch, undergr, Au, Ag
Gen Mgr: A H Burroughs, Jr
Under devel
400-TON FLOT MILL

TAYLOR, IVAN J

Ketchum
PHI KAPPA LEASE, Blain County, Au, Ag, Cu, Pb, Zn
Under devel

TAYLOR & PRITCHETT

Box 537, Mackay
CHAMPION MINE, Alder Cr dist, Custer County, Ag, Cu, Pb
Under devel
TEMPLE MOUNTAIN URANIUM CO
39 Exchange Place, Rm 23, Salt Lake City, Utah
Pres: Herman Heinecke
VP: George Heinecke
Sec: Augustus Reeves
CHALLIS VIEW MINE, Challis, Pb, Ag
Gen Mgr: Herman Heinecke
Asst Gen Mgr: George Heinecke
Geol: B E Grant
Idle
(See Utah)

TREASUREMENT MNG CO

1123 10th Ave N, Seattle, Wash
Pres & Gen Mgr: W J Logus
Sec & Treas: M A Logus
QUIGLEY MINE, 6 1/2 mi E of Halley, undergr, Pb, Ag
Geol: James M McDonald
Mine Supt: Al Linderman
Idle

TRIUMPH MNG CO

Triumph
Pres: J W Sweet
VP: E H Snyder
Sec-Treas: John W Hamilton
Purch Agt: L K Van Sickle
TRIUMPH MINE, Triumph, undergr, Pb, Ag, Zn
Gen Mgr: L M Robinson
Elec Eng: James B Deering
Ch Eng & Acting Mine Supt: J M Barrett
Prod: 300 tons
Under devel
300-TON FLOT MILL, Triumph

TWIN RIVERS, INC

Riggins
Pres & Gen Mgr: Bill White
Sec-Treas: Max Maynard
GOLDEN RULE MINE, Warren, placer, Au, Ag, Monazite
Asst Gen Mgr: Rex Winters
Idle

UNITED IDAHO MNG CO

808 Newhouse Bldg, Salt Lake City, Utah
Pres & Gen Mgr: Roger V Pierce
UNITED IDAHO MINE, Gilmore, undergr, Pb, Ag
Idle

URANIUM EXPLORATION CORP OF IDAHO

281 Main Ave E, Twin Falls
Pres: Bert A Sweet, Sr
VP: Bert Sweet, Jr
Sec-Treas: Leonard Mauss
Purch Agt & Mine Supt: Lawrence Severs
PARK CANYON MINE, Twin Falls, 27 mi from Ketchum, undergr, surface, U₃O₈
Under devel

VENDETTA CHIEF MNG CO

Murray
Pres: Maynard H McPhee
VP: Florence Lillie
Sec-Treas: Helen C McPhee
MINE, Murray, Pb, Ag
Gen Mgr: Chas U Burnes
Idle

VINDICATOR SILVER-LEAD

MNG CO
Wallace
Pres: W J Logus
VP: Mrs A M Logusdon
Sec-Treas: H F Magnuson
VINDICATOR MINE, 2 mi E of Mullan, undergr, Pb, Ag, Zn
Under devel

WAKEMAN, J Q

1417 N 5th St, Boise
MINE, Elmore County, placer, Au, Ag
Idle

WALKER ENGR CORP

612 Dooly Bldg, Salt Lake City 1, Utah
Pres: W J Walker
VP: R T Walker, Jr
Sec: Belle T Walker
MINNIE MOORE MINE, Blaine County, undergr
(Under lease to Silver Star-Queens Mines, Inc, Idaho)
(See Colo, Utah)

WALKER, JOHN M

3625 18th St, Lewiston
RUBY CREEK, Ruby Creek dist, Clearwater County, Au, Ag, Cu, Pb, Zn
Under devel

WALL & HEATH

Box 117, Fairfield
CAMAS COUNTY DIATOMITE MINE, open pit, diatomite
Idle

WAR EAGLE MNG CO, INC

114 E Chestnut St, Yakima, Wash
WAR EAGLE MINE, McCall, undergr, Au, Ag
Gen Mgr: E W Peterson
Idle
75-TON HEAVY MEDIA MILL, McCall
(See Wash)

WARREN DREDGING CORP

(J R SIMPLOT CO SUBSID)
Boise
Pres: J R Simplot
VP: L E Haight
Sec-Treas: John M Dahl
(See J R Simplot, Idaho)

WASATCH MNG & DEVEL CO

Preston
MINE, Bear Lake County, Ma
Under devel

WEST STAR MNG CO

1221 Sixth, Coeur d'Alene
Pres: K H Blasser
VP: Chas U Burnell
Sec: Julia M Hughes
Treas: A Burnell
WEST STAR MINE, Box 8, Gem, undergr, Pb, Ag, Zn, Au
Gen Mgr: A Markwell
Idle

WESTERN CONS MINES, INC

Box 1400, Eastman Bldg, Boise
Pres & Gen Mgr: Gene Jack
VP: John F Miller
Sec & Treas: B M Andrews
Gen Supt: E Adrecht
OPHIR MINE, Rocky Bar, undergr, Au, Ag
Idle
50-TON FLOT MILL

WESTERN STATES MINES

INC
Box 1, Council
Pres: H M Kleinschmidt
VP: H G Kleinschmidt

ILLINOIS

Sec-Treas: Carl H Swanstrom
PLACER BASIN GROUP, CARBONATE
HILL GROUP, PEACOCK GROUP,
BLUE JACKET GROUP, Guprum,
undergr, open pit, Cu, Ag, Au,
WGs
Under devel

WHELCHER MINES CO
1019 Arthur St, Caldwell
Pres: William E Whelchel
VP: Ralph A Whelchel
Sec-Treas: Thressa M Whelchel
TWIN BUTTES GROUP #1, Owyhee
County, Box 7, Caldwell, rare
earth, gypsum
Under devel

WHITE BROS LEASE
c/o B W White, S S Star Route,
Kellogg
LIBERAL KING MINE, Shoshone
County, Au, Ag, Cu, Pb, Zn
Idle

**WHITEDELPH EXTENSION
MNG CO**
421 Michigan St, Sandpoint
Pres: E F Abromett
VP: E N Welo
Sec-Treas: Oscar M Welo
WHITE DELPH EXTENSION MINE,
Clarkfork, undergr, Ag, Pb
Gen Mgr: Sven A Anderson
Idle

**WHITEDELPH MNG & DEVEL
CO**
Clarks Fork
Pres & Mgr: Compton I White, Jr
VP: W W von Cannon
Sec: E I Fisher
WHITEDELPH MINE, 2 mi N of
Clarks Fork, undergr, Ag, Pb, Au, Zn
Under devel
50-TON FLOT MILL

WHITE KNOB MNG CO
Newhouse Bldg, Salt Lake City,
Utah
Pres: O A Glasner
HOMESTAKE, COPPER QUEEN
MINES, Alder Creek, Mackay,
Pb, Zn, Ag

WILBERT MINING CO
316 Kearns Bldg, Salt Lake City,
Utah
Pres & Treas: R J Hogan
VP: M F O'Reilly
Sec: Claude Engberg
DAISY BLACK GROUP, 35 mi E of
Howe, undergr, Pb, Zn
Idle
75-TON CONC
Idle

WILCOX, G & W CLUTIS
Dayton
ELLS GROUP, Bayhorse dist,
Custer County, Au, Ag, Cu, Pb, Zn

WILSON, E S
Dubois
HARD ROCK MINE, Clark County, Fe
Idle

WILSON, S P
Tamasack
BURNT ROCK, Adams County, Mn

WINDMAISER, FRANK
Golden
MOORE CREEK MINE, Idaho County,
Zn
Idle

YOUNG, RULON
Salmon
GRANDVIEW #1 & 2, Lemhi County,
Au, Ag, Cu
POPE SHENON DUMP MINE, Eureka
dist, Lemhi County, Cu, Ag, Au

ZANETTI BROS
Wallace
BIG CREEK, CEBURN & DeBLOCK
TAILINGS, Evolution dist, Shoshone
County, Ag, Pb, Zn, Cu
Under devel

ZOOK, JOE E
Leadure
RAINBOW MINE, Ada County, Au, Ag,
Cu, Pb
Idle

ALUMINUM CO OF AMERICA
Alcoa Bldg, Pittsburgh 19, Pa
Pres: F L Magee
VPMng Div: L Litchfield, Jr
PAIRVIEW-BLUE DIGGINGS
Biscailiere
Gen Supt: W S Steels
Geol: F E Williams
Mech Eng: H E Efner
Met: W C Lay
Purch Agt: T H Fallwell
MINE, undergr, CaF₂, Pb, Zn
Mine Supt: W H Harrison, Jr
Mine Frm: L Billington
Chief Eng: S G Bowman
Mine Eng: Walter Gammeter, Jr
Prod: 400 tons
HMS FLOT MILL, at mine
Mill Supt: W C Lay
Asst Supt: T K Loyd
(See Ark, Penn)

AMERICAN COLLOID CO
Merchandise Mart Plaza
Chicago 54
Pres & Gen Mgr: Paul Bechtner
VP & Treas: W D Weaver
VP: E P Weaver
VP: Clyde A Sanders
Asst Sec: Jeanette Salmon
Purch Agt: Roy H Harris
(See Miss, S Dak, Wyo)

**AMERICAN SMELTING &
REFINING CO**
Federal
FEDERAL SMELTER, Pb
Mgr: L J Buck
Supt: James H Vose
(See Ariz, Calif, Colo, Idaho, Kans,
Md, Mont, Nehr, N J, N Mex, N Y,
Ola, Tex, Utah, Wash and Federal
Mng & Smelting Co, Mol)

**AMERICAN ZINC CO OF
ILLINOIS (Subsidiary of AMERICAN
ZINC, LEAD & SMLT CO)**
1515 Paul Brown Bldg, St Louis 1,
Missouri
SMELTER, Fairmont City, Roasting
& by-product plant
VP & Gen Mgr: G L Spencer, Jr
Gen Supt: George Kromen
Purch Agt: G E James
ELECTROLYTIC SMELTER, Monsanto
Mgr: L P Davidson
Gen Supt: T I Moore
Purch Agt: V M Provov
Prod: 54,000 tons hi-grade slab
zinc annually
SMELTING & PROCESSING PLANT,
Hillsboro
Mgr: H R Wampler
MetDiv Supt: J F Clark
Gen Frm: H J Collett
Oxide Supt: Oscar Hassel
Assay: Orville Rutledge
Prod: 12,400 tons Amer prod zinc
oxide yrly
2,700 tons Fr prod zinc oxide
yrly
7,150 tons slab zinc yrly
(See Ariz, Mo, Ohio, Okla, Tenn,
Tex, Wash, Wisc)

CALUMET & HECLA, INC
Peoples Gas Bldg, 123 S
Michigan Ave, Chicago 3
Exec VP: H V Bassett
(See Mich, N Mex)

**EAGLE Picher CO, MNG &
SMELTING DIV**
Box 1040, Galena
GRAHAM MINE, Galena, undergr,
Zn, Pb
Gen Mgr: R L Haffner
Gen Supt: H H Hannan
Geol: Wm J Arndt
Met: Albert Thayer
Maint Supt: T A Ray
Maint Frm: Clarence Lyden
Mine Supt: E L Houy
Mine Frm: Harold Wisco
Mine Eng: H B Farrey
Prod: 1,800 tons
GRAHAM MILL, Galena, flot & grav
Mill Supt: C C Crow
Mill Frm: Glen Brotsman
Assayers: Ed O'Neil & Richard
Simmons
Prod: 1,800 tons of Zn daily
(See Kans, Nev, Ohio, Okla, Wisc)

GOOSE CREEK MNG CO
10 Public Square, Belleville
Sec-Treas: C D Blair
MINE, near Cave in Rock, CaF₂

HICKORY HILL MNG CO
Galena
MINE, Pb, Zn

HOEB MNG CO
Cave-in-Rock
Pres: P A Hill
VP: B W Bales
Sec-Treas & Gen Mgr: Lowell Oxford
HOEB MINE, undergr, CaF₂, Pb, Zn
Gen Supt: Ray Crabb

INLAND STEEL CO
First Nat'l Bank Bldg, Chicago 3
Pres: Joseph Block
VP, Raw Materials: P D Block, Jr
Sec: Graydon Megan
Treas: W H Love
(See Ky, Mich, Minn)

**INTERNAT'L MINERALS
& CHEMICAL CORP**
CONSOL FELDSPAR DEPT
20 N Wacker Dr, Chicago 6
Pres: Louis Ware
VP, Ind Min Div: Norman J Dunbeck
Mgr, Consol Feldspar Dept: E W
Koenig
Asst Mgr: Phil Blasovic, Jr
VP's: G W Moyers, M H Lockwood,
P D V Manning, George
Hamilton, N J Dunbeck,
Howard F Roderick, H C White
VP & Treas: A R Cahill
VP & Gen Counsel: E D McDougal, Jr
Admin VP: T M Ware
Corp Sec: C M Edwards
Purch Agt: J P Burrows
(See Ariz, Colo, Fla, Me, Miss,
N Mex, N C, Ohio, S D, Tenn, Va,
Wyo)

**MATTHIESSEN & HEGELER
ZINC CO**
LaSalle
LaSALLE WORKS, Zn
Pres: H D Carus
VP & Gen Mgr: C R MacBrayne
Sec: E H Carus
Treas: H D Carus
Gen Supt: R Wasshowskiak
Mech Engr: H Larson
Safety Engr: V Novak
Purch Engr: A La Flamme
SMELTER (Retort)
Capacity: 32,000 tons Zn per yr

**MINERVA OIL CO,
MINERVA OIL CO, FLUOR-
SPAR DIV**
Div'n Off: Myers Bldg, Box 531
Eldorado
VP & Gen Mgr: Gill Montgomery
Pur Agt & Sls Mgr: S J Kelly
MINERVA MINE No 1, Cave-in-Rock,
undergr, CaF₂, Zn
Mine Supt: C F Callahan
Mine Frm: James Charlton
Eng: D B Holbrook
Mng Eng: J J Daly
Geol: Donald W Saxby
Prod: 325 tons per day
250-TON FLOT MILL: CaF₂, Zn conc
Mill Supt: Wm Rule
Chem: C B Rush
Assayer: A C Reed
CRYSTAL MINE, Rt 1, Elizabethtown,
undergr, CaF₂
Plant Mgr: I V Robertson
Mine Frm: Raymond Dutton
Prod: 500 tons per day
750-TON HMS and FLOT MILL,
met, grade & acid grade fluorspar;
Crystal mill: Acid & Ceramic & met
fluorapatite; sinter & lead concentrate
Mill Frm: Jas Frailey
Met: D C Speer
VICTORY MINE, Rt 1, Elizabethtown,
undergr, CaF₂
Idle
JEFFERSON MINE, Rt 4, Golconda,
undergr, CaF₂
Mine Frm: Ray Stone
Prod: 80 tons per day
ROSE CREEK MINE, near Herod,
undergr, CaF₂
Idle
(See Mo)

MORTON SALT CO
120 S La Salle, Chicago 3
Pres: Daniel F Rin, Jr
VP: H R Stratford
VP, Prod: R C Vall
Sec: L M McBride
Treas: Garfield King
Purch Agt: H L Esthos
(See Kan, La, Tex)

NEW JERSEY ZINC CO, THE
Box 129, Harrisburg
Zn Geol: R C Bing
(See Colo, N J, N Mex, N Y, Pa,
Tenn, Va, Wia)

**OSARK - MAHONING CO,
MNG DIV**
Box 57, Rosiclare
Pres: C O Anderson
VP & Gen Mgr: A G Johnson
Purch Agt: C W Shosky
DEARDORFF, W L DAVIS #2,
NORTH GREEN, EAST GREEN,
MAHONING MINES, SHAFTS 2,
3, 5, 11, 16 & HILL-LEDFORD,
undergr, fluorspar, Zn, Pb
Mine Supt: Edward Powell, Jr
Asst Mine Supt: Wm H Melcher
Mine Frm: J H Scott, J L Price
Prod: 500 tons
500-TON FLOT MILL, at mine
Mill Supt: W W Fowler
Asst Mill Supt: R H Herman
Mill Frm: P N Hobbs
Assay: Wm Smith
(See Colo, N Mex, Okla)

**ROSICLARE LEAD &
FLUORSPAR MNG CO**
Rosiclare
Pres: J Blachisen
VP: Stanley Holland
Sec-Treas: A T Souder
Cashier: R A Browning
MINE, undergr, fluorspar
Prod: 300 tons
300-TON FLOT MILL, at mine
(Leased to Wiley Cochran, M L Conn
& Ted Joiner)
(See Ky)

SO ILLINOIS MNG CO
Rte 4, Golconda
Pres: H Evan Roberts
JEFFERSON-HUMM MINE, 6 mi W
of Rosiclare, fluorapatite, undergr
Gen Mgr: Adrian Borenfeld
Gen Supt: Robert O'Brien
Geol: R Kellogg
Prod: 75 tons
100-TON HEAV-MEDIA MILL, at
mine
DOUGLAS MINE, Pope Co, CaF₂
Prod: 50 tons

REDD MNG CO
RFD #4, Golconda
HAMP MINES, northern Hardin
County, CaF₂

SWIFT & CO
Union Stock Yards, Chicago
(See Fla)

TAMORA MNG CO
Rosiclare
MINE, Pope County, CaF₂

TRI - STATE ZINC, INC
123 Williams St, New York 36,
N Y
Pres: R F Playter
VP: V C Allen
Sec-Treas: J H Nicholls
GRAY MINE OPERATION, Galena,
undergr, Zn, Pb
Gen Mgr: V C Allen
Geol: Paul Herbert, Jr
Mine Supt: Joseph J Nolan
Mine Frm: Orville W Lickes
Mine Eng: R J Kuehneman
Prod: 1,000 tons
1,000-TON FLOT-GRAY MILL,
Galena
Mill Supt: Dorsey E Hammock
(See N Y, Va)

U S GYPSUM CO
300 W Adams St, Chicago 6
Chrm Bd: C H Shaver
Pres: O M Knode
VP, Op: E Rembert
VP, Manufact: C W Desgrey
VP, Purch: H C Bear
Sec-Treas: F L Seeliner
Mgr Mines: F C Appleyard
(See Calif, Colo, Conn, Ind, Iowa,
Mass, Mich, Mont, Nev, N Mex,
N Y, Ohio, Okla, Tex, Utah, Va)

VICTOR CHEMICAL WORKS
155 N Wacker Dr, Chicago 6
Pres: Robbe Weigel
VP: F M Anobile, T G Everett,
M R Stanley
Sec: F W Hansen
Treas: F S Schwerdt
Purch Agt: M E Jones
(See Fla, Mont)

ZONOLITE CO
135 La Salle St, Chicago
Pres: John D Myers
VP: Dayton L Prouty, Daniel J Boone,
Joe A Kelley, Robert W Sterrett
VP & Treas: Walter J Bein
Sec: J H Bishop
Purch Agt: Leo O Frans
(See Mont)

INDIANA

NATIONAL GYPSUM CO
325 Delaware Ave, Buffalo 2, N Y
MINE, Shoals, undergr, gypsum
Pl Mgr: M B Turner
Mine Supt: Max Abrams
Prod: 1,300 tons
MILL, at mine
(See Iowa, Kans, Mich, N Y, Ohio, Pa, Tex, Va)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
MINE, Shoals, undergr, gypsum
Works Mgr: J R Burns
(See Calif, Colo, Conn, Ill, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

IOWA

BALD MOUNTAIN MNG CO
Clinton
Pres: O D Collis
Sec-Treas: W H Reisdorf
(See S D)

BESTWALL GYPSUM CO
Fort Dodge
MINE & PLANT, gypsum
(See Kansas, Mich, N Y, Pa, Tex, Utah)

FORT DODGE GYPSUM CO
Fort Dodge
NO 1 MINE, gypsum

NAT'L GYPSUM CO
Fort Dodge
QUARRY & PLANT, gypsum
Plant Mgr: J B Pitts, Jr
Mine Supt: Wm Canney
Prod: 1,000 tons
(See Ind, Kans, Mich, N Y, Ohio, Pa, Tex, Va)

NORTHWEST GYPSUM CO
Fort Dodge

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
OPEN QUARRY, Ft Dodge, gypsum
Works Mgr: M E Davidson
(See Calif, Colo, Conn, Ill, Ind, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

KANSAS

AMERICAN ROCK CRUSHER CO
3700 Rainbow Blvd, Rosedale, Kansas City 3
Pres: F M Tobin
VP & Sec: P A O'Rourke
Treas: F M Tobin
UNDERGR WORKINGS, limestone
Mine Supt: J C Williamson

AMERICAN SALT CORP
630 N Y Life Bldg, Kansas City 6, Mo
SALT MINE, Lyons, undergr, evapor

AMER SMELT & REFIN CO
Baxter Springs
Gen Supt: W C Ball
MINE, undergr, Zn, Pb
Idle
(See Ariz, Calif, Colo, Idaho, Ill, Md, Mont, Nebr, N J, N Mex, N Y, Tex, Utah, Wash, & Federal Mng & Smelting Co, Mo)

BARTON SALT CO
Hutchinson
Pres: C H Humphreys
VP: R S Humphreys
Sec: G R Allan
Treas: Elizabeth H Summers
SALT MINE, Evaporated
Plant Mgr: R C Lindell

BESTWALL GYPSUM CO
120 E Lancaster Ave, Ardmore, Pa
MINE, Blue Rapids, undergr, gypsum
(See Iowa, Mich, N Y, Pa, Tex, Utah)

BROWN MNG CO
1734 Park Ave, Baxter Springs
MINE, 1 mi W of Baxter, undergr, Zn, Pb
Idle

C & M MINING CO
Box 328, Baxter Springs
Supt: H G Milligan
ST LOUIS #4, IMBEAU MINES, undergr, Zn, Pb
200-TON GRAV-FLOT MILL
Idle

CAREY SALT CO
Box 618, Hutchinson
Pres: H J Carey, Jr
VP: W D P Carey
Sec: D P Johnson
Treas: R N Apple
Purch Agt: F L Johnson
MINE, Hutchinson, undergr, salt
Gen Mgr: Leo Reid
Mech Eng: Ron Stone
Mine Supt: Everett Roberts
Prod: 1,000 tons
MILL, Hutchinson
Mill Supt: C Millard
(See La)

CASSELL MNG CO
611 Sergeant Ave, Joplin, Mo
Gen Mgr: J W Asherton
MINE, SE of Baxter Springs, undergr, Zn, Pb
(Formerly Ajax Mng Co)

COLLINS & THOMAS
Commerce
MINE, 1/4 mi N W of Treese, undergr, Zn, Pb
(Formerly Sheeran Mng Co)

EAGLE PICHER CO, MNG & SMELT DIV
Cardin, Okla
LUCKY JEW, BIO JOHN BILHARZ, GRACE B, WEBBER, WESTSIDE, Zn, Pb
LEAD SMELTER & ACID PLANT, Galena
Mgr: Fred Clearman
(See Ill, Nev, Ohio, Okla, Wisc)

GARNETT ROCK CO
Garnett
Own: E F Bronahan
UNDERGR WORKINGS, limestone

GOLDEN ROD #24
Box 41, Cardin, Okla
MINE, 3/4 mi W of Hwy #60, Pb, Zn

HELEN H MINING CO
Box 326, Baxter Springs
Mgr: Claude Jones
MINES, Baxter Springs, Kans & Picher-Cardin, Okla areas, undergr, Zn, Pb

INDEPENDENT SALT CO
4115 Packers Ave, Chicago, Ill
SALT MINE, Kanopolis, undergr

O W KERFORD QUARRY CO
Rt 1, Atchison
UNDERGR WORKINGS, limestone

LITTLE BEN MNG CO
c/o Kenneth Childress
Box 228, Baxter Springs
MINE, 2 mi SW of Baxter, Pb, Zn
Idle

LORING QUARRIES CORP
Bonner Springs
UNDERGR WORKINGS, Loring

MARK TWAIN MNG CO
Picher, Okla
Supt: Harold Childress
MINE, undergr, Zn, Pb
Idle

MASON MNG CO
1918 Park, Baxter Springs
MINE, 1 mi W of Baxter, undergr, Zn, Pb
Idle

McCOY & CAREY MNG CO
612 S River St, Picher, Okla
MINE 2 mi SW of Baxter, Pb, Zn
Idle

MID-CONTINENT LEAD & ZINC CO
1101-1/2 Military, Baxter Springs
Pres: Kenneth Childress
MINES, WRIGHT LAND GROUP AND JARRETT MINE
Idle

MORTON SALT CO
120 S La Salle, Chicago 3, Ill
SALT MINE, Hutchinson, evapor
(See Ill, La, Tex)

NANCY JUNE MNG CO
Box 14, Baxter Springs
Supt: W E Grayson
ROBERTSON MINE, 11 mi W of Baxter, undergr, Zn, Pb
Idle

NATIONAL LEAD CO
Box 30, Baxter Springs
TRI STATE OPERATIONS
Gen Supt: Geo R Schaefer
Met: Corbin Marsh
BALLARD, HARTLEY, SHANKS, KEITH, SWALLEY, SMITH, CLARK MINES, undergr, Pb, Zn
Prod: 1,600 tons
3,300-TON GRAV-FLOT MILL
Mill Supt: Jay Shoemaker
(See Ark, Calif, La, Mont, Mo, Nev, N Y, Tenn, Tex, Wyo)

NAT'L GYPSUM CO
Medicine Lodge
MINE & PLANT, gypsum
Plant Mgr: D C Chads
Mine Supt: Brad Saboda
Prod: 1,000 tons
(See Ind, Iowa, Mich, N Y, Ohio, Pa, Tex, Va)

RACE TRACK MNG CO
Box 29, Baxter Springs
Supt: Rex Craig
MINE, W of Baxter, undergr, Zn, Pb
Idle

SEARCY & HENDERSON MNG CO
Box 281, Picher, Okla
BENDELARI MINE, NW of Picher, undergr, Zn, Pb
WILBUR MINE, Near Treese, undergr, Zn, Pb
Supt: D W Searcy

SILVER STREAK CO
Baxter Springs
Own: Mr Zuvekas
MINE & MILL, 1 mi S of Baxter
undergr, Zn, Pb

THOMPSON STRAUSS QUARRIES
Rt 2, Kansas City 6
MINE, Morris, undergr, limestone

THUNDERBIRD MNG CO
Rte 1, Box 95, Baxter Springs
Supt: Clyde Hopkins
MINE, 1 mi W of Baxter, Zn, Pb
(Subleased from Mason Mng Co)

W M & W MNG CO, INC
Box 366, Picher, Okla
Pres: O K Tucker
VP: F E Williams
Sec & Treas: Ralph Chambers
Purch Agt: O K Tucker

KENTUCKY

INLAND STEEL CO
Marion
FLUORSPAR OPER
Supt: W G Robinson
(See Ill, Mich, Minn)

KENTUCKY FLUORSPAR CO
Marion
Pres: R N Fraser
VP: Frank Stegeman
Sec-Treas: Sam Eugenheim
Purch Agt: E W Fraser
TWO 100-TON FLOT MILLS, Marion
TWO 5-TON HEAV-MED MILLS, Marion
Mill Supt: E W Fraser

KING CONSTRUCTION CO
Rte 4, Columbus
Supt: Mr Wood
OLD QUEEN ESTHER MINE, 1 mi S, 2 mi W of Baxter, undergr, Zn, Pb
(Formerly Wood & Shira Mng Co)

LIVINGSTON MNG CO
P O Box 202, Marion
Pres: Wm Howard Crider
VP: Redge Winters
Sec-Treas: Howard Stout
NANCY HANK MINE, Salem, undergr, CaF₂
Under devel

PENNSYLVANIA SALT MNG CO
Marion
DYERS HILL SHAFT, undergr, CaF₂
MILL, at mine

ROSICLARE LEAD & FLUORSPAR MNG CO
Roelich, Ill
POMMY MINE, Crittenden County, undergr, CaF₂
Prod: 50-75 tons
(See Ill)

CAREY SALT CO
Winfield
MINE, Winfield, undergr, salt
Mgr: W H Cameron
Supt: Al Tracy
Mech Eng: J M Thornton
Mine Frm: J E Austin
Prod: 600 tons
MILL, at mine
(See Kans)

FREEMONT SULPHUR CO
161 E 42nd St, New York 17, N Y
LOUISIANA DIV, Commerce Eids, New Orleans, mines at Grande Escaille, Garden Island Bay, Bay Ste Elaine, Chacaboula
VP & Div Mgr: K T Price
(See N Y)

JEFFERSON LAKE SULPHUR CO
1408 Whitney Bldg, New Orleans 12
Pres: E H Walet, Jr
VP: H A Wilson, F E Lewis
VP & Sec: Chas J Ferry
VP & Treas: L L Lassalle
Purch Agt: Carl E McElrath
VP's: J T Files, E B Miller, H W Manley
STARKE DOME, Calcasieu Parish, So
(See Tex)

MORTON SALT CO
120 S La Salle St, Chicago 3, Ill
MINE, Weeks, salt
Gen Mgr: L J Broussard, Jr
Asst Gen Mgr: Wayne West
Prod: 1,200 tons
(See Ill, Kans, Tex)

NATIONAL LEAD CO
New Orleans
BARITE PLANT, dry grinding
Plant Supt: D M Middleton
(See Ark, Calif, Kans, Mont, Mo, Nev, N Y, Tenn, Tex, Wyo)

MAINE

BELL MINERALS CO
West Paris
PERHAM MINE, Oxford County, feldspar
Gen Mgr: H W Childs

INTERNAT'L MIN & CHEM CORP
20 N Wacker Dr, Chicago, Ill
MINES, Sagadahoc County, feldspar
50-TON MILL, Topsham
Gen Supt: J C Brannigan
(See Ariz, Colo, Fla, Ill, Miss, N Mex, N C, Ohio, Tenn, Va, Wyo)

PEMOBSCOT MNG CORP
HARBORSIDE, Brooksville
CAPE ROSIER MINE, undergr, Cu, Zn
Gen Mgr: K D Thomson
Explor

ROCKLAND-ROCKPORT LIME CO
Rockland
Pres: A E Orff
Gen Supt: H B Kaler
MINES, Knox County, open pit, limestone
200-TON MILL, Rockland

TOPSHAM FELDSPAR CO
Topsham
Pres: E W Booker
Gen Supt: D R Drenzo
TRENTON MINE, Sagadahoc Cty, feldspar, Quartz
Under devel
50-TON GRAV MILL, Cathance Rd, Topsham

MARYLAND

AMERICAN SMELTING & REFINING CO
Highland & Eastbourne Aves, Baltimore 24
BALTIMORE PLANT
Mgr: A J Kieff, Jr
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Mont, Nebr, N J, N Mex, N Y, Tex, Utah, Wash, Federal Mng & Smelt Co, Mo)

DAVISON CHEM CORP., THE

101 N Charles St, Baltimore 3
Pres: W E McGuire, Jr.
VP & Gen Mgr: Agri Chem Div:
D N Huesman
Asst Gen Mgr, Agri Chem Div:
J M Harris
(See Fla)

POWHATAN MNG CO

5721 Windsor Mill Rd, Baltimore 7
Pres & Gen Mgr: F A Mest
VP & Sec: C Silver
Treas: E L Farley
Off Mgr: F E Mett
15-TON MILL, Woodlawn, Baltimore 7
Supt: Dennis Smith
Asst Supt: Charles Liptrap
(See Calif, Ga)

UNITED CLAY MINES CORP

Poplar
MINE #2, open pit
Mine Supt: H Michael Brenz
Prod: 100 tons
50-TON FLOT MILL, at mine
(See Fla, Ga, N J, Tenn, SC)

MASSACHUSETTS

COPPER RANGE CO

24 Federal St, Boston 10
Pres: J P Lally
VP: Nelson J Darling, Jr.
John V O'Connor, Robt H
Jacobson, C DeWitt Smith
Sec: J R Ackroyd
Treas: D M Goodwin
Purch Agt: S H Bailey
(See Copper Range, Mich, White
Pine Copper Co, Mich)

U S GYPSUM CO

300 W Adams St, Chicago 6, Ill
MINE, Farnsworth, open pit, limestone
Works Mgr: E E Long
(See Calif, Colo, Conn, Ill, Ind, Iowa,
Mich, Mont, Nev, N Mex, N Y, Ohio,
Okla, Tex, Utah, Va)

U S SMELTING, REFINING, & MNG CO

75 Federal St (Box 2137), Boston
Pres: F S Mulock
(See Alaska, Ariz, N Mex, Utah)

WHITE PINE COPPER CO

24 Federal St, Boston 10
Pres: J P Lally
VP: W F Nicholls, Geo McGrath
Sec: J R Ackroyd
Treas: D M Goodwin
Purch Agt: Russell Baird
(See Copper Range Co, Mich & White
Pine Copper, Mich)

MICHIGAN

CALUMET & HECLA, INC., CALUMET DIV

1 Calumet Ave, Calumet
VP & Gen Mgr: A S Kromer
Dir of Purch: W A Banz
Dir, Ind & Pub Rel: H D Stett
NO 3 AMHEEK, ALLOUVE, CEN-
TENNIAL NO 2, AMHEEK NO 2,
PENINSULA, SERENA, Calumet,
undergr, Cu
Dir, Mng: C A Campbell
Ch Geol: J P Pollock
Proj & Specif Eng Mgr: P H Ostlander
Mech Proj Eng: R R Spencer
Elec Proj Eng: A W Hill
Prod: 8, 600 tons
8, 000-TON GRAY-PLAT MILL
Dir, Mgr: R K Poull
CALUMET & HECLA SMELTER
Hubbell, S reverb Cu furnaces
Dir, Smeltg & Ref: K F Farley
Prod: 90, 000, 000 lbs Cu yearly
OSCEOLA NO 8 MINE & NO 10,
Calumet, undergr, Cu
Under devel
CENTENNIAL NO 3 MINE, Calumet,
undergr,
Explor
CALEDONIA MINE, Greenland,
undergr, Cu
Explor
(See Ill, N Mex, N Y)

CLEVELAND-CLIFFS IRON CO, ORE MNG DEPT

1460 Union Commerce Bldg,
Cleveland 14, Ohio

Pres: Walter A Sterling

Asst to Pres: Grover J Holt
VP, Mining: C W Allen
Sec: Robert M Kimmel
Treas: J P Long
MICHIGAN OPER, Ishpeming
Mgr, Mich Mines: J S Westwater
Mgr, Ore Devel: S W Sundeen
Gen Supt: H C Swanson
OHIO-WEBSTER MINE, Daraga
County, surface, Fe
Supt: K C Olson
BUNKER-HILL-MAAS MINE,
Marquette County, undergr, Fe
Supt: T A Kaupilla
CAMBRIA-JACKSON, Marquette
County, undergr, Fe
Supt: R L Tobie
CLIFFS SHAFT, Marquette County,
undergr, Fe
Supt: O Marjama
MATHER MINE, Marquette County,
undergr, Fe
Asst Supt, "A" Shaft: Gil Dawe
Asst Supt, "B" Shaft: R L Tobie
undg Supt, "A" & "B" Shafts: A J
Audein
TILDEN MINE, Marquette County,
surface, Fe
Supt: K C Olson
HUMBOLDT MINE, Marquette County,
surface, Fe
Supt: K C Olson
REPUBLIC MINE, Marquette County,
surface, Fe
Supt: E W Lindroos
RESEARCH LAB, Marquette County,
Ishpeming
Ch Met: L J Erck
Proj Eng: D K Campbell
PELLETIZING PLANT, Marquette
County
Supt: H W Rembold
ORE IMPROVEMENT PLANT,
Marquette County
Supt: Robert DeGabriele
MNG METHODE RESEARCH DEPT
Supt: John M Hatala
(See Minn, Ohio)

COPPER RANGE CO

24 Federal St, Boston 10, Mass
CHAMPION MINE, Painesdale,
undergr, Cu
Gen Mgr: Henry Combella
Mine Supt: L Coppiolano
Elec Eng: M Myers
FLOT MILL, Freda
Supt: John Harris
(See Mass, Copper Range Co & White
Pine Copper Co)

HANNA COAL & ORE CORP

Iron River
Gen Mgr: R W Whitney
Mgr, Mich Mines: W F Shinnars
Gen Supt, undergr mines: K R
Kuehlthou
Gen Supt, open pit mines: E W Geist
Ch Geol: A E Walker
Dist Geol: P W Zimmer
Mech Eng: Warren W Jamar
Elec Eng: Carl W Anderson
Purch Agt: G E Tromblay
WAUSECA MINE, undergr, Fe
Mine Supt: J D McAuliffe
Mine Cpt: W A Lundwall
Prod: 2, 000 tons
GROVELAND MINE, Randville,
open pit, Fe
Mine Supt: F H Lee
Gen Foreman: B Seattio
4, 000-TON MILL, Randville
(See Minn, Ohio, Osark Ore Co, Mo)

HANNA IRON ORE DIV, NAT'L STEEL CORP

Iron River
Mgr, Mich Mines: W F Shinnars
Gen Mgr: R W Whitney
Gen Supt: K R Kuehlthou
Ch Geol: A E Walker
Dist Geol: P W Zimmer
Mech Eng: Warren W Jamar
Elec Eng: Carl W Anderson
Purch Agt: G E Tromblay
CANYON MINE, Stambaugh, undergr,
Fe
Mine Supt: G A Koehler
Mine Capt: H Krane
Prod: 1, 900 tons
HIAWATHA MINE, Iron River,
undergr, Fe
Mine Supt: J R Quayle
Mine Capt: H Thornberg
Prod: 2, 000 tons
HOMER MINE, Iron River, undergr,
Fe
Mine Supt: J D McAuliffe
Mine Capt: G Johnson
Prod: 1, 900 tons
(See Minn, Ohio, Osark Ore Co, Mo)

INLAND STEEL CO, IRON ORE OPER

424 S Pine St, Ishpeming
Pres: Joseph L Block
Sen VP: P D Block, Jr
Sec: Graydon Megan
Treas: W H Lowe
MORRIS & GREENWOOD MDS,
Ishpeming
SHERWOOD MINE, Iron River
BRISTOL MINE, Crystal Falls,
undergr, Fe
Gen Mgr, Ore Mines: R D Satterley
Mgr, Ore Mines: H M Graff
Geol: A T Broderick
Mech Eng: J R Gronseth
Ch Eng: P P Ribotto
(See Ky, Ill, Minn)

JACKSON IRON & STEEL CO

Iron Mt
BRADLEY MINE, Fe
Prod: 26, 074 tons per year
(Operated by Edward C Bradley &
Sons)

JONES & LAUGHLIN STEEL CORP, MICHIGAN ORE DIV

Negaunee
TRACY MINE, undergr, Fe
Gen Mgr: R W Braund
Gen Supt: R L Balconi
Mech Eng: Michael Kerecman
Elec Eng: John B Motto
Mine Frm: R L Prideaux
Mine Eng: Wm A Benson
(See Minn, N Y, Pa)

NORTH RANGE MNG CO

Negaunee
Pres: F P Book
Ch of Bd: R S Archibald
VP: R Archibald
VP, Oper: F J Haller
Sec: E S Holmgren
Treas: Herbert V Book
Ch Elec: G H Peterson
Gen Supt: J C Kirkpatrick
Purch Agt: J M Archibald
BOOK MINE, Alpha
Supt: J A Nicolson
Mill Supt: J E Hayden
Capt: James Pelletier
CHAMPION MINE, Champion
Supt: R L Sundeen
Capt: Charles Coole
WARNER MINE, Amasa
Supt: J A Nicolson
Capt: A C Clements
LEONIDAS MINE, Eveleth
Supt: Hugh Clark
Capt: Leonard Erickson
PENOSKE, Ironwood
Supt: J Zaraw
Capt: Wm Bianchi

PACIFIC ISLE MNG CO

2521 First Ave, Hibbing, Minn
WAKEFIELD MINE, Wakefield,
surface, Fe
(See Minn)

PICKANDS MATHER & CO, (MANAGING AGENTS)

Gogebic Dist, Ironwood
Gen Supt: Carlton D Bailey
Asst Gen Supt: F R Werther
Dist Mng Eng: J L Sharrer
Ch Clerk: A W Bulinski
Dist Safety Supt: George Gerry
MAUTHE MNG CO,
GENEVA MINE, Ironwood, undergr
Supt: R L Jose
MAUTHE MNG CO,
NEWPORT MINE, Ironwood, undergr
Supt: R L Jose
Asst Supt: A J Cigallio
PURITAN MNG CO,
PETERSON MINE, Bessemer, undergr
Supt: J C Wanguard
Asst Supt: L G Woodworth
SUNDAY LAKE IRON CO,
SUNDAY LAKE MINE, Wakefield,
undergr
Supt: R D Hodge
MENOMINEE RANGE, Caspian
Supt: W E Seppanen
Dist Mng Eng: Gusdag Anderson
Ch Clerk: S K Brew
VERONA MNG CO,
BUCK MINE, Caspian, undergr
LAWRENCE MINE, Crystal Falls
Ida
MARQUETTE RANGE (same super-
visory personnel as above)
PALMER MNG CO,
VOLUNTEER MINE, Palmer
(See Minn, Wisc)

REPUBLIC STEEL CORP

Genl Off: Republic Bldg
Cleveland 1, Ohio
Dist Off: 204 Bellwood Bldg,
Duluth 1, Minn

Dist Mgr: F H Cash
Ch Mng Eng: S C Howell
Ch Mech & Elec Eng: I V Crego
TOBIN-COLUMBIA-MONONGAHELA
MINE, Crystal Falls, undergr, Fe
Mine Supt: E H Anderson
Mine Frm: Emil Johnson
Assay: J Trevarthen
Prod: 250, 000 tons per year
(See Ala, Minn, N Y, Ohio)

U S METALS REFINING CO

Waukegan
Explor
(See N Y, American Metal Climax,
Inc, N Y)

WHITE PINE COPPER CO

24 Federal St, Boston 10, Mass
WHITE PINE MINE, White Pine,
undergr, Cu
VP & Gen Mgr: William P Nicholls
VP & Asst Gen Mgr: Geo R McGrath
Geol: Dr E L Ohle
Met: Virgil L Lessels
Mech Eng: G F Haberman
Elec Eng: John A Roller
Mine Supt: L A Garfield
15, 000-TON FLOT MILL, White Pine
Mill Supt: Ivan T Downman
Asst Mill Supt: Ross E Gamble
REVERB SMELTER, White Pine
Supt: Geo D Weaver
(See Copper Range Co & White Pine
Copper Co, Mass)

MINNESOTA

BUTLER BROS

Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Cuyuna Range, Minn, Fe,
Mn
GALBRAITH, GALBRAITH ANNEX
MINE, Nashwauk Twp
HARRISON, HALOBE, HOADLEY,
NORTH HARRISON, NORTH
HARRISON ANNEX, QUINN GROUP
MINE, Nashwauk, Nashwauk Twp,
Cooley
PATRICK ANN, PATRICK ANNEX,
KEVIN, LANGDON, DAVID, SNYDER
GROUP MINE, Cooley, Greenway Twp
WYMAN MINE, Nashwauk Twp
MIDWEST GROUP MINE, Nashwauk,
Nashwauk Twp
MACKILLICAN MINE, Nashwauk
(See Ohio)

CHARLESON IRON MNG CO

P O Box 335, Power Bldg, Hibbing
Pres & Sec: C H Remer
VP & Purch Agt: A T Siebels
Treas: E F Remer

CHATACO MNG CO

(See Pacific Isle Mng Co)

CLEVELAND-CLIFFS IRON CO, ORE MNG DEPT

1460 Union Commerce Bldg,
Cleveland 14, Ohio
Pres: Walter A Sterling
Asst to Pres: Grover J Holt
VP, Mng: C W Allen
Sec: Robert M Kimmel
Treas: J P Long
MINNESOTA OPER, 2031 E 2nd Ave,
Hibbing
Mgr, Minn Mines: H J Leach
Gen Supt: W A Pakkala
HAWKINS MINES, Nashwauk, surface
WASH PLANT, H M S PLANT
Supt: William Le Clair
HILL-TRUMBLE MINE, Marble,
open pit
WASH & H M S PLANT, Calumet
Supt: A E Hill
HOLMAN-CLIFFS MINE, Coleraine,
open pit
Supt: J J Foucault
WASH & H M S PLANTS, Coleraine
Supt: J J Foucault
WANLESS MINE, Buhl, open pit
Supt: Mel Viani
CANISTEO MINE, Coleraine, open pit,
wash, H M S Plant
Supt: Ronald Pearson
(See Mich, Ohio)

CONSUMERS ORE CO

Hibbing (M A Hanna Co, Agents)
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
BARGERT RESERVE, Calumet
Mn
(See Ohio)

COONS PACIFIC CO

Box 37, Eveleth
Pres: H H Harrison
Supt: D C Kimball
CUSTOM IRON ORE CONCEN
9,000 TON GRAV-HEAVY MEDIA
MILL, Eveleth
Supt: R G Hurd
(See Pacific Isle Mng Co)

DOUGLAS MINING CO

Hibbing (M A Hanna Co, Agents)
Mgr of Minn Mines: B M Andreas
Asst Gen Mgr: R C Wallace
Ch Eng: R O Buck
MINES, Mesabi Range, Fe
DOUGLAS, DUNCAN GROUP MINE,
Balkan Twp
NEVILLE RESERVE, Stunts Twp,
Ida
SHENANGO RESERVE, Chisholm
Ida
(See Ohio)

HALEY-YOUNG MNG CO

2223 First Ave, Hibbing
Pres: E A Young
Sec-Treas: David D Haley
ELBERN MINE, 2 mi SE of Fraser,
surface, Fe
Supt: Leo Cashen
Frm: Michael Molick
(See Young, E A, Inc, Minn)

HANNA COAL & ORE CORP

Hibbing
Mgr, Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
ARGONNE LEACH, CARLE #2,
EAST ALPENA, HUNT, PERRY
MINES, Cuyuna Range, ALSTEAD,
SO ALSTEAD, ARKO, NO HILLCREST
& EXTENSION, SO HILLCREST,
HUNTINGTON, FEIGH, MAROCCO,
MUSSER, SECTION 8
MINES, Fillmore & Mower County,
Q BAKER, H BLY, M BONNERUD,
G BORNFELETH, O BREHMER, W A
L BYRGE, M COOPER, R COPEMAN,
J DEPOPE, N FENSTERMACHER,
W FREEMAN, H GRAMM, K HAFNER,
F HALL, JR, H HASLAM, J H
HEBIO, J HENDRICKSON, B W
HINGEVOLD, G KAPPERS, A KUMM,
W LEE, H M LONG, C MANDELKO,
A MATHISON, L MCNER, W MENSINK,
G MEYER, O MEYER, K OLSON, T
OLSON, OSTERUD & DUNCANSON,
B PEARCE, J PRINSEN, P RUSEINK,
G SCHMIDT, G TART, H & C THORSON,
B O THORSON, C WINTER
(See Mich, Ohio, & Ozark Ore Co, Mo)

HANNA IRON ORE DIV, NAT'L STEEL CORP

Box 720, Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Cuyuna Range, Fe, Ma
CUYUNA, DUNN, POLK, TABERT
PORTSMOUTH GROUP MINE, Crosby
MINES, Mesabi Range, Fe
BECKFELT, PINNEGAN, LUNDBROAN,
NATCHEZ, POKEGAMA GROUP RES,
HUNNER MINE, Coleraine
(See Mich, Ohio)

HANNA ORE MINING CO

Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
BRAY, GORDON, GORDON ANNEX,
MESABI CHIEF, MISS #3, STEIN
GROUP MINE, Nashua Twp, Kee-
waun
ENTERPRISE MINE, Virginia
PIERCE GROUP, Hibbing
(See Ohio)

HOLLAND MNG CO

(See Pacific Isle Mng Co)

INLAND STEEL CO, IRON ORE OPER

Iron
ARMOUR NO 1 & NO 3 MINES
Supt: A T Anderson
(See Ky, Ill, Mich)

JESSIE H MNG CO

Box 488, Grand Rapids
Pres: R W Hallett
VP: R W McGiffert
JESSIE MINE, 3 mi E of Grand Rapids,
open pits, Fe
Mine Supt: L R Sewall
Mine Frm: Ari Anderson
Mine Eng: J J Walker
Prod: 1,400 tons
3,000-TON MILL, 3 mi E of Grand
Rapids

JONES & LAUGHLIN STEEL CORP, MINN ORE DIV

Virginia
Mgr: H F Kallberg
Asst Mgr: R E Duracher
Western Dist Supt: J F Linden
Eastern Dist Supt: P W Kruse
Supt of Maint: D Madich
Ch Acct: T A Parish
Res Eng: W F Gaspar
Res Geol: T E Stephenson
Ch Mag Eng: C H Grant
Ch Ore Dressing Eng: R W Livingston
Super, Pers Rel: C E Dickens
Mine Ind Eng: L E Hodli
MINES, Mesabi Range, surface, Fe
HILL ANNEX MINE, MILL &
TAILINGS RECLAMATION PLANT,
Columet
Mine Supt: W Ball
Mill Frm: N L Abercrombie
Plant Frm: G D Barth
LONGYEAR MILL & MINE, Hibbing
Dist Supt: J F Linden
Mine Supt: J Strande
LOND-GREENWAY MINE, Coleraine
Dist Supt: J F Linden
Mine Supt: A C Seaberg
Under devel
COLUMBIA MINE & MILL, Virginia
Dist Supt: P W Kruse
SCHLEY-PETTIT MINE & MILL,
Gilbert
Dist Supt: P W Kruse
(See Mich, N Y, Pa)

LITHIUM CORP OF AMERICA INC

Rand Tower Bldg, Minneapolis, Minn
Pres: Herbert W Rogers
VP: Fremont F Clarke
Sec: Salisbury Adams
Treas: W W Osborne
Purch Agt: John W Douglas
Asst: Fred Dixon
(See NC)

W S MOORE CO

400 Torrey Bldg, Duluth
Pres: W S Moore
Sec: H A Nelson
Geol: J V Everett
RANGE OFFICE, 425 W Grant St,
Hibbing
Gen Mgr: H E Reese
Ch Eng: J M Jadsen
Gen Supt: John Johnson
Mech Supt: W F Arnold
Gen Plant Frm: W Kinnunen
Office Mgr: R J Kennedy
JUDSON MINE, 1 mi S of Duhl, surface,
Fe
JUDSON CRUSHING & SCREENING
PLANT
MARSKA MINE, 1 mi NE of Oulbert,
surface, Fe
HEAVY MEDIA CONCENTRATOR
ALICE, NORMAN, STUBLER &
YAWKEY MINES, surface, Fe

MORTON ORE CO

Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
MORTON, SOUTH EDDY GROUP
MINE, Stunts Twp
Mine Supt: L M Bredvold
Asst Mine Supt: John E Bemis
Mine Frm: M A Englund

OGLEBAY NORTON & CO

The Hanna Bldg, Cleveland, Ohio
NORTHERN OFFICE, 300 Christie
Bldg, Duluth
Ind Rel Dir: H J Gemenaden
Mng Eng: A F Torreyano
ST JAMES MINING CO, Aurora
Mgr: Oglebay Norton & Co
ST JAMES MINE, Aurora, surface, Fe
Supt: H L Knudsen
Asst Supt: T H Tridley
Master Mech: Walter Williams
Ch Elec: Edward M Plattner
(See Ohio)

PACIFIC ISLE MNG CO

2321 First Ave, Hibbing
Pres: Hugh H Harrison
VP & Gen Mgr: John D Boente, Jr
Treas: D J Keeler
Sec: H T Binger
Gen Supt: Arne O Tuomala
Asst to Gen Mgr: Eng: H M Hart, Jr
Asst to Gen Mgr: Met: Donald C
Kimball
Mineral Devel Dept: G T Beardshear
Ch Eng: A T Vellella
Mgr, Zonitelli Div, Pittsburgh Pacific
Co, Nelo Hill
INCLUDES: CHANDLER MNG CO,
CHATACO MINING COMPANY,
COONS PACIFIC COMPANY,
HOLLAND MINING COMPANY,
PITTSBURGH PACIFIC CO -

Zonitelli Div

MINES: CHANDLER, CHATACO,
CROXTON-SYME, FOWLER-MEADOW,
GRAHAM-WENTWORTH, HOLLAND,
BROQUES, JULIA-COMMOORE,
LAMBERTON, MANGAN-JOAN-STAI,
MANUEL, MILL, MISSABI MTH,
MISSISSIPPI #1, ST PAUL, SHADA,
STEVENSON, UNO-KERR GROUP,
VIRGINIA, WACOOTAH, WEST
AIRPORT, WESTAR
PLANTS: NORTH UNO CONCEN
Plant Superv: Jack Durham
COONS PACIFIC CONCEN
Plant Superv: Ralph Hurd
VIRGINIA CONCEN
Plant Superv: Earl Saari
JULIA WASHING PLANT
MANUEL WASHING PLANT
ST PAUL WASHING PLANT
(See Mich)

PHILBIN MNG CO

1300 Leader Bldg, Cleveland, Ohio
WEOGUN-WOUTH LONGYEAR GROUP
Box 730 Hibbing
Mgr of Minn Mines: B M Andreas
Asst Mgr of Minn Mines: R C Wallace
Gen Supt: R B Crist
Mech Eng: J F Vidmar
Elec Eng: F M Bohan
Purch Agt: G H Shields
MINES, surface, Fe
Mine Supt: L M Bredvold
WASH PLANT

PICKANDS MATHER & CO

700 Sellwood Bldg, Duluth 2
Assoc Mgr: A D Chisholm
Gen Mgr: E L Joppe
Mgr of Eng: O L Yauch
Assoc Gen Mgr: D M Chisholm
Asst: A L Johnson
Ch Mech Eng: B W Bernstrom
Purch Agt: D A Brunau
Supvr of Safety & Ind Rel: E A Anundsen
HIBBING DIST, Mesabi Range, Hibbing,
Fe

Gen Supt: T C Thielman
Asst Gen Supt: R T Bell
Dist Mng Eng: R W Sullivan
Ch Clerk: W S Home
Dist Safety Supvr: C E Hager
CRETE MINING CO, ALBANY MINE
& WASHING PLANT, Hibbing, undergr
Supt: T R Trueman
HOYT MINING CO, SCRANTON MINE
CRUSHING & WASHING PLANT,
Hibbing, surface
Supt: E C Sponberg
MAHONING ORE & STEEL CO,
MAHONING MINE, Crushing, Hibbing,
surface
Supt: W D Webb
UTICA MNG CO, CARMICARSON
LAKE MINE & CRUSHING PLANT,
Hibbing, surface
Supt: J E Schelske
BALKAN MNG CO, DANUBE MINE
& BENEFACTION PLANT, Bovey,
surface
Supt: W L Thome

WESTERN MINING CO, WEST HILL
MINE & BENEFACTION PLANT,
Grand Rapids, surface
Asst Supt: L T Lang
CUYUNA DIST, Cuyuna Range, Crosby
Gen Supt: J P Schemmel
Dist Mng Eng: D W Carlton
Ch Clerk: Matt Kayfex
CUYUNA ORE CO, MAHMONEN
MINE & CRUSHING PLANT, Crosby,
surface
Supt: H Stetson

SAGAMORE ORE MNG CO,
SAGAMORE MINE, CRUSHING &
DRYING PLANT, Riverton, surface
Supt: H Stetson
YOUNGSTOWN MINES CORP
RAHBIT LAKE MINE & CRUSHING
PLANT, Crosby, surface
Supt: H Stetson
(See Mich, Wisc)

PIONEER MNG CO

Box W, Biwabik
Pres: Frank S Bergstrom
Ch of Bd: Patrick Butler
Sec: F J McArthur
Treas: R J Flosser
MARY ELLEN MINE, 1/2 mi W of
Biwabik, surface, Fe
Mine Supt: H F Manseau, Jr
Mine Frm: Frank Press, Jr
MILL, Biwabik

PITTSBURGH PACIFIC CO

(See Pacific Isle Mng Co)

REPUBLIC STEEL CORP

Gen Off: Republic Bldg, Cleveland
1, Ohio
Dist Off: 304 Sellwood Bldg, Duluth

Dist Mgr: F H Cash
Ch Mng Eng: S C Howell
Ch Mech & Elec Eng: I V Crege
SUSQUEHANNA MINE, Hibbing,
open pit
Supt: M C Woodie
Eng: S V Smith, Jr
(See Ala, Mich, N Y, Ohio)

RESERVE MNG CO

Silver Bay
Pres: W M Kelley
VP: C L Kingsbury
VP & Treas: J Wm Bryant
Sec: J J Dwyer
Mgr of Oper: E C Lampman
Purch Agt: E K Woods
Dir Pub Rel: Edward Schmid
Dir Ind Rel: W L Edwards
Pelletizing Supt: K M Haley
Crushing & Concen Supt: E M Purness
PETER MITCHELL TACONITE MINE,
Babbitt, open pit, taconite
Mgr, Babbitt Div: Floyd W Erickson
Mine Supt: F E McIntire
SILVER BAY PLANT, E W Davis
Works, Silver Bay, magnetic separation
(See Ohio)

RHODE & FRYBERGER

Box 778, Hibbing
Part: J O Rhode, R M Fryberger
TROY MINE, Eveleth, Mesabi Range,
open pit, Fe, H M S & JG PLANT
BOEING MINE, Hibbing, Mesabi
Range, open pit, Fe, Wash Pt
PENNINGTON MINE, Ironton,
Cuyuna Range, undergr, Fe
CARLSON-NELSON MINE, Cuyuna
Range, open pit, Fe
HMS & JG PLANT

ST JAMES MNG CO

(See Oglebay Norton Co)

SKUBIC BROS CO

705 6th Ave N, Virginia
Pres & Treas: Frank Skubic
VP & Purch Agt: Edward Skubic
VIRGINIA MINE, Eveleth, 3 mi S
Virginia, surface, Fe
Gen Supt: Edward Skubic
Mine Frm: Luther Swanson
Elec Eng: Karl Sulentic
Ida
Mill Frm: Joseph Spolar

SNYDER MNG CO

1101 Alworth Bldg, Duluth 2
Pres: Wm P Snyder, Jr
VP & Gen Mgr: A L Fairley, Jr
Gen Supt: C O Rudstrom
Ch Eng: A C Borgeson
Ch Chem: A W Johnson
Mech Supt: A A Erickson
Comptroller: V O Youngdahl
Purch Agt: C J Hathaway
Supvr, Mobile Eqp: O E Larsen
Gen Maint Frm: J Zobitz
WEBB MINE, Hibbing, open pit, Fe
Mine Supt: J J Marcy
Gen Mine Frm: A E DesRostier
Asst Gen Mine Frm: J J Munter
Res Eng: E Zobitz
4,000-TON GRAV MILL
Mill Frm: A E Erickson
WHITESIDE MINE, Buhl, open pit, Fe
Mine Supt: R M Baker
Asst Mine Supt: T J Barker
Gen Mine Frm: A Buhl
Res Eng: D C Swalm
Master Mech: F C Hodge
20,000-TON GRAV-MILL, at
Whiteside mine
GODFREY MINE, Chisholm, undergr,
Fe
Mine Supt: H F Haller
Mine Capt: O A Aselom
Mine Eng: K P Coen
Master Mech: J V Vidmar
(See Pa)

SOUTH AGNEW MNG CO

Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
SOUTH AGNEW, AGNEW NO 2
GROUP MINE, Stunts Twp
Mine Supt: L M Bredvold
Asst Mine Supt: John E Bemis
(See Ohio)

US STEEL CORP, OLIVER IRON MNG DIV

Wolvine Bldg, Duluth 2
Pres: R T Elstad
VP-Oper: W N Matheson
Asst to VP-Oper: L S Campbell,
W E Cotter, Jr
VP-Administrative: R O Hawkness
Asst Sec: H P Clarke
Treas: R B Davern
Comptroller: W F Hittner

Mgr Mng Eng: N A Moborg
 Mgr Geol Investigation: R W Marsden
 Mgr Beneficiation: A T Koenen
 Mgr Research: R J Morton
 Mgr, Inshot Eng: G T Martin
 Superv Ore Movement: F J Perry
 Ch Eng: C N Bailey
 Dir, Ind Rel: J S Bonte
 Purch Agt: L L Shabodnik
 Ch Grader: G H Shartach
 EASTERN DISTRICT, Virginia
 Gen Supt: John Chisholm
 Asst Gen Supt: M V Millar
 Supt of Maint: J A Vitzthum
 Asst Supt of Maint: C A Lindberg,
 C R Peterson,
 W A Hyde
 Ch Mng Eng: J T Nolan
 Ch Chem: I R Lerohl
 STEVENS MINE, Mesabi Range,
 surface, Fe
 Supt: D Hartley
 Asst Supt: E J E Olson
 EVELETH MINE, Mesabi Range,
 surface, Fe
 Supt: F D Hoover
 Asst Supt: T C Oliver
 PILOTAC MINE, Mesabi Range,
 surface, Fe
 Supt: I H Rubow
 ROUGHLEAU MINE, Mesabi Range,
 surface, Fe
 Supt: E V Nelson
 Asst Supt: D B Muckler
 PIONEER MINE, Vermillion Range,
 undergr, Fe
 Supt: L E Dick
 Asst Supt: J D Warner
 SOUDAN MINE, Vermillion Range,
 undergr, Fe
 Supt: E M Holmes
 EKTACA PLANT, Mesabi Range,
 agglomerating
 Asst Supt: C W Niemi
 HIBBING-CHISHOLM DISTRICT,
 Hibbing
 Gen Supt: J H Hoarding, Jr
 Asst Gen Supt: M G Hilland
 Supt of Maint: J R Schoen
 Asst Supt of Maint: K L Prothero
 Ch Mng Eng: M R Serron
 Ch Chemist: W E Holliday
 HILL RUST MINE & CONCENTRATOR,
 Mesabi Range, surface, Fe
 Supt: E C Silver
 Asst Supt: W J McGuire
 BREMER MINE GROUP, Mesabi
 Range, surface, Fe
 Supt: M J Forsmark
 Asst Supt: M D VanDelinder
 PILLSBURY MINE, Mesabi Range,
 surface, Fe
 MONROE MINE, Mesabi Range,
 surface, Fe
 Supt: W W Beebe
 Asst Supt: E M Gilmore
 FRASER MINE, Mesabi Range,
 undergr, Fe
 CANISTEO DISTRICT, Coleraine
 Gen Supt: E A Friedman
 Asst Gen Supt: M E Johnson
 Supt of Maint: A C Prisk
 Asst Supt of Maint: R N McIndoo
 Ch Mng Eng: L E Battles
 Ch Chem: M O Carlson
 ARCTURUS MINE, Mesabi Range,
 surface, Fe
 Supt: H F Bolton
 KING MINE, Mesabi Range, surface,
 Fe
 Supt: J H Harrison
 Asst Supt: L Sclipton
 PLUMMER MINE, Mesabi Range,
 surface, Fe
 Supt: A F Savage
 Asst Supt: F J Hitchcock
 TROUT LAKE CONCENTRATOR,
 Mesabi Range
 Asst Supt: V V Ahola
 PLUMMER CONCENTRATOR,
 Mesabi Range
 ARCTURUS CONCENTRATOR
 Asst Supt: T O Olsen
 (See Alaska, Ala, Calif, Pa, Tenn,
 Utah, Wyo)
 YOUNG, E A INC
 2223 First Ave, Hibbing
 Pres: E A Young
 VP & Supt: Nels Kempaninen
 Sec: D D Haley
 MINNEAPOLIS MINE, P O Box 118,
 Virginia, 3 mi E of Virginia, Mesabi
 Range, surface & undergr, Fe
 Frm: A N Heikkila
 (See Haley-Young Mng Co, Minn)
 ZONTELLI BROS. INC
 Ironton
 Pres: Emil Zontelli
 VP: Henry Zontelli
 Sec-Treas: Anne V Stang
 Gen Mgr: W E Hill

Gen Supt: Henry Zontelli
 Met: John Simons
 Geol: Elton LaSart
 Mech Eng: Francis Chase
 Elec Eng: Dan Deoben
 Purch Agt: Ernest Kutzner
 VIRGINIA MINE, N of Ironton,
 Cuyuna Range, surface, Fe
 4,000-TON VIRGINIA PLANT
 TROMMALL
 MINNESOTA MINES
 GRAHAM NO 1 MINE, Mesabi Twp,
 Mesabi Range, surface, Fe
 MANGAY-JOAN MINE, Irondale,
 Cuyuna Range, surface, Fe
 MERRITT LEAN ORE STOCKPILE,
 Trommald, Cuyuna Range
 MANUEL MINE, Crookby, Cuyuna
 Range, surface, Fe
 2,500-TON MANUEL PLANT, Crookby
 (See Wisl)

MISSISSIPPI

AMERICAN COLLOID CO
 Merchandise Mart Plaza
 Chicago 54, Ill
 ABERDEEN MINE, surface, bentonite,
 Aberdeen
 Supt: Edward G Birkholz
 ABERDEEN MILL
 Cap: 250 tons
 WHITE SPRINGS MINE, surface,
 bentonite, White Springs (P O at
 Aberdeen)
 Supt: Edward G Birkholz
 (See Ill, S Dak, Wyo)
 INTERNAT'L MINERALS &
 CHEMICAL CORP
 Smithville (P O Amory)
 Jgr: C M Clay
 Supt: J Flowers
 SOUTHERN BENTONITE MINE,
 open pit
 (See Ariz, Colo, Fla, Ill, Mo, N Mex,
 N C, Ohio, Tenn, Va, Wyo)

MISSOURI

AMERICAN ZINC, LEAD &
 SMELTING CO
 1515 Paul Brown Bldg, St Louis
 Pres: H I Young
 VP: Thornton Emmons, Alvin C
 Elde, Richard A Young,
 Howard L Young
 VP & Treas: W J Matthews, Jr
 VP & Cont: C V Burns
 VP, Chg Traffic: Nel S Worrell
 Sec & Ch Counsel: R C Perkins
 Asst Sec & Asst Treas: R K Wall,
 L S Jones
 (See Ariz, Ill, Miss, Ohio, Okla,
 Tenn, Tex, Wash, Wisc)
 APEX MNG CO
 Putawi
 MINE, Washington County, barite
 BARYTES MNG CO
 Putawi
 MINE, Washington County, barite
 BIG FOUR MNG CO
 Miami, Okla
 MINE, Newton County, Zn
 BRUFORD MNG CO
 DeSoto
 MINE, Jefferson County, barite
 DESOTO MINING CO
 226 S Main St, DeSoto
 MINE, surface, barite
 FEDERAL MNG & SMELTING CO
 (Wholly-owned subd of Amer
 Smelting & Refining Co)
 DUTCHMAN MINE, Jasper, Pb, Zn
 Idls
 GENERAL BARITE CO
 DeSoto
 Pres: J Marshall Thompson
 VP: C M Faulkner
 MINE, Blackwell, barite
 H & P MNG CO
 Putawi
 MINE, Washington County, barite
 HOLLY, E A, MNG CO
 Riverside, Texas
 MINE, Washington County, barite

HORNSEY BROS
 P O Box 398, Potosi
 MINE, 1 mi S of Potosi, Wash
 County, open pit, barite
 Mine Frm: H H Hall, Romie Blair
 180-TON GRAY MILL
 KOSHKONONG MNG CO
 Koshkonong
 MINE, Howell County, Fe
 MAGNET COVE BARIUM CORP
 Potosi
 MINE, Potosi, open pit, barium
 Plant Mgr: George L Carter
 Asst Plant Mgr: Floyd H Carter
 Asst to Plant Mgr: R J Menze
 WASHINGTON PLANT, at mine
 Supt: B J DeChes
 250-TON MILL, at mine
 Supt: Russell Degonia
 (See Fla, Nev, Tex, Wyo)
 MIDWEST MNG CO
 Box 87, Potosi
 MINE, Washington County, barite
 MINE LA MOTTE CORP
 250 Park Ave, N Y 17, N Y
 Pres: Andrew Fletcher
 VP: C M Chapin, Jr, Jos A Martino
 VP & Treas: George I Bridgen
 Sec: Donald K Lourie
 MINE LA MOTTE, undergr, surface,
 Pb, Bonne Terre
 Div Mgr: E A Jones
 Div Supt: F F Redfield
 3,000-TON FLOT-GRAY MILL,
 Fredericktown
 MINERAL POINT MNG CO
 West Plains
 MINE, Howell County, Fe
 MINERVA OIL CO,
 FLUORSPAR DIV
 320 N 4th St, St Louis
 Pres: Joe Desloge
 VP: Joe Desloge, Jr
 Sec: Berkley Jones
 Gen Mgr: Gill Montgomery
 (See Ill)
 MONSANTO CHEM CO
 Lindbergh & Olive St Rd,
 St Louis 4
 Pres: Charles Allen Thomas
 Dir of Mng: G Donald Emigh
 INORGANIC DIV
 Gen Mgr: J L Christian
 Div Eng: W T Durrett
 MINES & PLANT, Monsanto, Tenn,
 elemental phosphorus
 Plant Mgr: Edward J Bock
 (See Idaho, Tenn)
 NATIONAL LEAD CO,
 BAROID DIVISION
 FOUNTAIN FARM, Potosi, surface,
 barite
 WET GRIND MILL
 Supt: E L H Sackett
 (See Ark, Calif, Kans, La, Mont, Nev,
 NY, Tenn, Tex, Wyo)
 NATIONAL LEAD CO, ST
 LOUIS SMELTING & REFIN-
 ING DIV
 Box 351, Fredericktown
 Gen Mgr: O D Niedermeyer
 Mgr: Harold A Krueger
 MADISON MINE, Fredericktown,
 undergr, Pb, Cu, Ni, Co
 Gen Supt: J E Phoebe
 Mine Supt: F H Hurst
 Geol: R P Uhley
 Met: Corbin Marsh
 Elec Eng: R W Slavens
 1,450-TON FLOT MILL
 Mill Supt: G F Coopes
 REFINERY, Fredericktown
 Mgr: W R McCormick
 Supt: G E Peters
 Under devel
 (See Ark, Calif, Kans, La, Mont,
 NY, Tenn, Tex, Wyo)
 OZARK ORE CO
 Iron Mountain
 IRON MOUNTAIN MINE, undergr,
 Iron ore
 Gen Supt: R P Matson
 Geol: John Murphy
 Mine Frm: Byron Miller
 Mine Eng: R P Hubbard
 Master Mech: Henry Gratton
 Chief Elec: Vic Callisto
 3,000-TON GRAY MILL
 Mill Supt: Lloyd Erpenbach
 Mill Frm: Leo Williams, Luther
 Williams
 Assay: R E Kay
 (See M A Hanna Co & Oark Ore, Ohio)

PATRILLO MNG CO
 Caulfield
 MINE, Howell County, Fe
 POTTER SIMS MINES INC
 Box 399, Joplin
 Pres: Geo W Potter
 VP & Gen Mgr: D S Sims
 Gen Supt: Leonard Parker
 Mine Supt: Jack Bolding
 Asst Mine Supt: John Skinner
 Mine Frm: Geo T Brown
 SUCKER FLAT MINE, Webb City
 WESTSIDE MINE, 1/2 mi S of Alba
 open pit, Pb, Zn
 2,500-TON FLOT-GRAY MILL, Webb
 City
 Mill Supt: Floyd C Cain
 Idls
 ST JOSEPH LEAD CO
 250 Park Ave, N Y 17, N Y
 Pres: Andrew Fletcher
 VP's: C M Chapin, Jr, Francis
 Cameron, R J Mechin
 VP-Treas: George I Bridgen
 VP & Sales Mgr: Charles R Ince
 SOUTHEAST MISSOURI MNG & MLO
 DIV, Box 33, Bonne Terre, undergr,
 Pb, Zn
 Div Mgr: Elmer A Jones
 Ch Geol: John S Brown
 Gen Mech Supt: B L Beal
 Div Supt, Indian Cr Mine & Mill:
 K R Baker
 Gen Mine Supt: L L Turley
 Asst Gen Mine Supt: C B Davis,
 B T Wyckoff
 S-FLOT-GRAY MILL
 Gen Mill Supt: T J Clifford
 Mill Supt: H A Hoffman, H R Stahl,
 M N Dunlap, K B Hall
 Asst Mill Supt: E J Krotzkoska
 Cap: 24,000 tons
 BLAST FURNACE, Herculeum
 Div Mgr: W T Isbell
 Cap: 100,000 tons lead yrlly
 (See N Y, Pa)
 SHOOK & FLETCHER SUPPLY
 CO
 West Plains
 KINGSBURY MINE, Howell County,
 open pit, Fe
 Gen Mgr: E H Craddock
 Mine Supt: Robert Wilson
 (See Ala)
 STEPHENS MNG CO
 2nd & Jefferson St, West Plains
 Part: Carroll J Stephens, W H
 Stephens
 MINE, 6 mi W of West Plains, open
 pit, Fe
 Prod: 50 tons
 WASHER, at mine
 TERRACE MINING CO
 Potosi
 Pres & Gen Mgr: Dall B Groves
 VP: Julia E Floyd
 Sec: Robert D Evans
 TERRACE MINE, 7 mi N Potosi,
 surface, barite
 Mine Frm: Harry D Patterson
 Prod: 50 tons
 75-TON GRAY MILL
 Mill Frm: Harry D Patterson
 UTLEY, A T
 P O Box 398, Oage Girardeau
 NEWER MINE, Oregon County, open
 pit, Fe
 Mine Supt: A T Utley
 Mine Frm: Cecil Weiden
 Prod: 150 tons
 MONTANA
 AMAZON MNG CO
 Box 372, Coeur d'Alene, Idaho
 Pres: A E Lunden
 Sec-Treas: Geo M Servick
 MINE, near Harlow, As, Ag, Cu
 Mont Agt: Joe Brooks, Nonon
 Under devel
 (See Idaho)
 AMERICAN CHROME CO
 1 Montgomery St, San Francisco 4
 California
 Pres: Willis A Swan
 VP & Gen Mgr: John Bley
 Sec: Geo M Sgrdaling
 Treas: John L Lukens
 Purch Agt: D W Graves
 MOUNT-SAMPSON MINE, Nye,
 undergr, chrome conc

Geol: E S Rugg
Prod: 1,000 tons
1,000-TON FLOT MILL, Nye

AMERICAN MACHINE & METALS, INC., TROUT MNG DIV

223 Broadway, New York 7, N Y
Pres: C W Anderson
Sec: Alphonse Kenison
Treas: Robert G Burns
TROUT-ALCOQUIN GROUP,
Phillipsburg, 2 mi E of Phillipsburg,
undergr, Ag, Zn, Pb, MnO₂
Gen Mgr: Roy McLeod
Asst Gen Mgr: Roy Hamilton
Geol: Frederick D Owsy
Mine Supt: Thomas Purtille
Prod: 175 tons
SIS-TON GRAY MILL
Mill Supt: Thomas Purtille
Mill Frnt: Kenneth Baser
(See N Y)

AMERICAN SMELTING & REFINING CO

JACK WAITE MINE, Sanders County,
Pb, Zn (See Idaho)
Supt: C H Blackwell
EAST HELENA PLANT, East Helena,
Custom Lead Smelter
Mgr: Joseph T Roy
Supt: S M Lane
(See Ariz, Calif, Colo, Idaho, Ill,
Kans, Md, Nehr, N J, N Mex, NY,
Tex, Utah, Wash & Federal Mag &
Smelting Co, Mo)

ANACONDA ALUMINUM CO

Columbia Falls
Pres: R B Caples
VP: C H Steele
Sec-Treas: C E Moran
Purch Agt: A B Harris
Gen Supt: J F Smith
REDUC PLANT, Columbia Falls, Al
Mgr: H G Satterthwaite
Scheduled prod: 120,000,000 lbs
(See NY)

ANACONDA CO, THE

Butte
VP, Chg West Oper: C H Steele
Gen West Counsel: J T Finlen
Gen Mgr: West Mng Oper: A C Bigley
Asst to VP: J H Dickey, Jr
Asst Sec-Treas: D R Nelson
Mgr of Mines: E I Renouard, Jr
Gen Supt of Mines: A R Sims
Asst Ch Geol, Mo America: M H Gidel
Ch Geol Dept, Butte, E P Shea
Ch Mng Eng: Fred Strandberg
Ch Sampler: P K Ramsey
Ch Eng Research Eng: L F Bishop
Ch Mech & Elec Eng: C J Lundberg
Mech Supt: George Lilly
Asst Mech Supt: Paul Young, Frank
Ralph
Elec Supt: Merton Callow
Chmn, Bureau of Safety: H A Wendel
Ch Ventil Eng: J W Warren
West Purch Agt: W W Switzer
Labor Commissioner: Eugene Hogan
Dist Traffic Mgr: W L Kennedy
Ch Assayer: W C Gallagher, Jr
Supt, Washoe Sampler: Dennis E Leary
Frms, Precip Pl: J P Ryan
Block Cave Mng Eng: R C Corbett
Ch Draftsman: Marcus McCanna
Dir, Mng Research: E R Borchardt
Asst Gen Supt, Kelley Mine: Martin
Hannifan
Asst Gen Supt, Mt Con, Steward,
Supt, Rever: E O O'Leary
Supt, Dust Treat: J J Dougherty
Asst Gen Supt, Kelley Mine: Martin
Hannifan
Asst Gen Supt, Mt Con, Steward,
Emma & Original Mines: W R C
Russert
Asst Gen Supt, Berkeley Pit, Badger,
Lexington & Alice Mines & High
Ore Pumping Pl: E O Bommer
Asst Gen Supt, Orphan Girl, Belmont
& Leonard Mines: V D O'Leary
ALICE MINE, Butte dist, undergr, Zn
Asst Gen Supt: Ed Bonner
Idle
ANSELMO MINE, Butte dist, undergr,
Zn
Asst Gen Supt: V D O'Leary
Mine Supt: Sam Heatherly
BADGER MINE, Butte dist, undergr,
Zn
Asst Gen Supt: Ed Bonner
Frnt: Steve Hurley
BELMONT MINE, Butte dist, undergr,
Cu
Asst Gen Supt: V D O'Leary,
Frnt: John Kolevar
BERKELEY OPEN PIT COPPER MINE,
Butte dist, open pit, Cu

Asst Gen Supt: E O Bommer
Supt: G W Farber
Frnt: E E Morris
Mng Eng: J J Dougherty
EMMA MINE, Butte dist, undergr, Mn
Asst Gen Supt: W R C Russert
Frnt: William Kerrelah
HIGH ORE PUMPING PLANT, Butte
dist
Asst Gen Supt: Ed Bonner
Frnt: Joe Canavan
KELLEY MINE, GREATER BUTTE
PROJECT, Butte dist, open pit, Cu
Asst Gen Supt: Martin Hannifan
Asst Gen Supt, Filling oper: Hale
Strock

Mine Supt: John Killoy
LEONARD MINE, Butte dist, undergr,
Cu
Asst Gen Supt: Hale St rock
MINE Supt: Russell Powell
LEXINGTON MINE, Butte dist, under-
gr, Zn
Asst Gen Supt: Ed Bonner
Mine Supt: Dan Griffin
Idle
MT CON MINE, Butte dist, undergr,
Cu
Asst Gen Supt: W R C Russert
Mine Supt: John Suttie
Idle
ORIGINAL MINE, Butte dist, undergr,
Cu
Asst Gen Supt: W R C Russert
Idle
ORPHAN GIRL MINE, Butte dist,
undergr, Zn
Asst Gen Supt: V D O'Leary
Frnt: Herman Gullis
Idle
STEWART MINE, Butte dist, undergr,
Cu
Asst Gen Supt: W R C Russert
Idle
TRAYONA MINE, Butte dist, undergr,
Zn
Idle
ANACONDA REDUCTION WORKS
Anacoda
Mgr: W A Emanuel
Gen Supt: F H Day
Asst Gen Supt: J R Moore
Project & Devel Eng: C M Holstrom
Supt, Employee Relations: Milkwick
Supt, Concentration: F A Roeder
Supt, Smelting: E S Kramlick
Supt, Converting & Casting: J T
O'Donnell
Supt, Electrolytic Zinc Pl: F A
Balmanson
Supt, Roasters: A C Bigley, Jr
Supt, Electrolyzing & Casting: K O
Sweeney
Supt, Acid & Phosphate Pl: K F
Ruckwardt
Supt, Manganese Nodulizing Pl: E O
Strommen

Research Eng & Dir of Met Research:
F L Holdersred
Asst Research Eng: R E Sullivan
Testing Eng: T G Fulmer
Met: J H McCrea
Ch Chemist: E N Boyce
Mech Supt: L E Larsen
Supt of Construction: M A Stokke
Ch Draftsman: E F Dimock
Hygiene & Ventil Eng: H F Morris
Safety Eng: W J Needham
Supt, Emp: F X Barich
Supt, Fire & Watch Dept: J J Dillon
Supt, Slag & Tailings: J A Grant
Supt, Tram: I G Gnosse
Supt, Surface: J F Sladich
Supt, Repair Foundry: H M Hansen
COPPER CONCEN, 38,000 tons
per day
ZINC CONCEN, 4,000 tons per day
MANGANESE CONCEN, 1,500 tons
per day
COPPER SMELTER, 150,000 tons
per year
ELECTROLYTIC ZINC PLANT,
86,400 tons per year
SULPHURIC ACID PLANT, 600
tons 60° Bume acid per day
TREBLE SUPERPHOSPHATE PLANT,
100,000 tons per year
MANGANESE NODULIZING PLANT,
415 S D T per day
FERROMANGANESE PLANT, 3,250
S D T per month
ARSENIC PLANT, 1,000 tons white
arsenic per month
GREAT FALLS REDUCTION WORKS
Great Falls
Mgr: F S Welmer
Gen Supt: E D Tierney
Asst Gen Supt: L J Ingvalson
Mech Supt: J W Porter
Met: R J Lapee
Ch Clerk: W P Sneddon
EAST HELENA SLAG PLANT
Supt: R L Thompson

Asst Supt: A B Kane
ELECTROLYTIC & FURNACE
COPPER REFINERIES, 144,000 &
130,000 tons per year
Supt: S R Westgaard
Asst Supt: G Cadwell
Consultant: R H Miller
ELECTROLYTIC ZINC REFINERY,
182,000 tons per year
Supt: G T Weaver
Asst Supt: R H Bahlsier
EAST HELENA SLAG TREATING PL
Supt: R L Thompson
Asst Supt: A B Kane
(See Calif, Idaho, Nev, N Mex, N Y,
Utah)

ANTONIOLI, PETER & PETER JR

524 S Washington St, Butte
BURLINGTON MINE, Silver Bow, Mn
Idle
PHOSPHATE MINE, Highland dist,
phosphate rock
Under devel
TZARDA MINE, Butte dist, Mn, Zn
WHITEHALL MINE, Whitehall Dist,
Jefferson County, Au, Ag, Pb, Zn
Idle
SCRATCH ALL & CONTACT MINE,
Flint Creek dist, Mn, Au, Ag, Cu,
Pb, Zn
BASIN-JIB MINES LTD
100 Adelaide St, Toronto 1
Ontario
Pres: Denison Denny
VP: J Q Pierdon
Sec: Margaret B Smith
BASIN JIB MINES, Basin, Box 406,
Boulder, undergr, Au, Ag, Pb
Idle
BLACK & WHITE MNG CO
331 N Ave W, Missoula
Pres & Gen Mgr: Roger F Little
BROOKLYN MINE, Maxville, 4 mi N
of Phillipsburg, undergr & surface,
Ag, Pb, Zn, Cu
Under devel
D-G MINE, Maxville, Ag, Pb, Cu,
Au, Bi, U₃O₈
Under devel
(Leased to Treasure State Uranium Co,
Helena)

BUTTE COPPER & ZINC CO
25 Broad St, New York 4, N Y
Pres: A A Shears
VP & Treas: Miles MacDonald
Sec: John F Cole
EMMA MINE, 203 Lewisohn Bldg,
Butte, undergr, Mn, Zn, Ag, Pb, Au
Res Eng: Samuel Barker, Jr
Prod: 1,100 tons
(Operated by Anaconda Copper Mng Co)
(See N Y)

CAPITAL-SEABOARD CORP
(Formerly Capitol Uranium Co)
Box 1847, Farmington, N Mex
Pres: Joseph H Corbin
Exec VP: Charles W Vetter
Sec: William A Pope, Jr
Treas: Howard L Corbin
BOULDER IRON MINE, Park &
Sweetgrass Counties, open pit, Fe
Gen Mgr: Charles W Vetter
Asst Gen Mgr: Ray A Bennett
Under devel
(See Ariz, Idaho, N Mex, Tex, Utah)

CHARTER OAK MNG CO
Box 588, Elliston
CHARTER OAK MINE, Elliston,
5 mi S of Elliston, undergr, Pb, Ag,
Au, Zn
Gen Mgr: J T Bonner
Under devel
50-TON FLOT MILL, at mine
Under devel

COLOTAN URANIUM CORP
105 Midland Bank Bldg, Billings
Mgr: S P Kurth
SNAIL CLAIMS, U₃O₈
CONTACT MINING CO
524 Washington St, Butte
Pres: Peter Antonioli, Sr
Gen Mgr: Peter Antonioli, Jr
Met: Frank M Antonioli
SCRATCH ALL MINE, Phillipsburg,
undergr, Ag, Zn, Mn, Pb
HIGHLAND PHOSPHATE MINE,
Butte, 15 mi S of Butte, undergr &
surface, phosphate
Under devel

CRUMB, RAY W
Avon
HUMDINGER MINE, 21 mi N of Avon,
undergr, Au, Ag
Under devel
4-TON GRAY MILL
Under devel

CUMMINGS-ROBERTS
739 N Highland Ave, Los Angeles
38, California
Gen Part: H Evan Roberts
CRYSTAL MT MINE, 26 mi E of
Darby, open pit, CaF₂
Gen Mgr: John W Taber
Geol: Melvin Fabert
Mine Supt: Gordon Blackburn
Prod: 600 tons
SINKING MILL
Chem: William Bickel

DOMESTIC MANGANESE &
DEVEL CO
Box 117, Butte
Pres & Purch Agt: J H Cole
VP: S A Pumpelly
Sec-Treas: Cathryn C Keith
400-TON FLOT MILL with nodulizing
oxide & carbonate ore
ELKHORN MNG CO
Boulder Bank Bldg, Boulder
Pres, Gen Mgr & Purch Agt:
Wade V Lewis
VP: Hugh S Cannon
Sec-Treas: J T Lewis
ELKHORN & FREE ENTERPRISE
MINES, Elkhorn & Boulder, undergr
Geol & Mine Eng: Wade V Lewis
Under devel
WILSON-ELKHORN MINE, 2 mi S of
Clancy, undergr
Idle

FAITH MNG CO
Monarch
Pres & Treas: C M Wall
VP & Gen Mgr: T J Vaughn-Rhys
Sec: Blanche Mares
LIBERTY MINE, Barker mng dist,
undergr, Ag, Au, Pb, Zn
Under devel

FORMINCO INC
c/o Harry Anders, Townsend
MARIETTA MINES, 17 mi NW of
Townsend in Part dist, Au, Ag, Pb,
Zn
GARRETT MNG & MLG CO
P O Box 324, Anaconda
Own: Eugene Garrett
DELTA MINE, Red Lion Mng dist,
undergr, Au
FLOT MILL, North Fork Flint Creek
Under devel

HALF MOON MNG CO, INC
805 Midland Bank Bldg, Billings
Pres: Charles I Kolstad
VP: R N Lutes
Sec-Treas: William G Moust
BIG TIMBER CREEK MINE,
undergr, Pb, Ag, Au
Gen Mgrs: Charles I Kolstad &
Wm G Moust
Under devel
HALF MOON MINE, Independence
Dist, Au, Ag, Pb
Idle

HAND MINE
Argentina
Own & Oper: John Hand, Dillon
MAULDEN MINE, Argentina Dist,
Au, Ag, Pb, Cu, Zn
Mine Supt: Bill Hand, Dillon
Under devel (Prod two cars weekly)
BONNET CLAIMS, adjoining mine
Own: John & Bill Hand

HERR, F E
Box 368, Dillon
CHARTER OAK MINE, Blue Wind
dist, Beaverhead City, Ag, Pb
LEHMAN, WALTER
402 W Main St, Lewistown
SIR WALTER SCOTT MINE, 70 mi
W of Lewistown, undergr, Ag, Pb,
Cu, Zn, Au
Under devel
AMERICA MINE, 26 mi NE of
Lewistown, undergr, Pb, Ag, Au, Fluor-
ine
Under devel
WAR EAGLE MINE, 30 mi E of
Lewistown, undergr, Zn, Pb, Ag
Under devel
CHRISTOPHER COLUMBUS MINE,
undergr, Au, Ag, Pb, Cu
Idle
GOLD BUG MINE, undergr, Au, Ag, Cu
(phaser)
Under devel

LITTLE ROCKIES MNG &
DEVEL CO
Landsky
VP: Frank B Bryant
VP: Edward F Wiegand
Sec & Treas: Cecil Flinders
Purch Agt: Marion Heller
LITTLE BEN MINE, Landsky,
undergr, Au, Ag, Pb, Cu
Under devel

undergr, Au, Ag
Gen Mgr: Marion Heller
Supt: E E Wiegand
Geol: Barney Egli
Prod: 100 tons
100-TON FLOT & CYAN MLL,
Leadusky
Gen Mgr: Marion Heller
Mine Eng: Frank B Bryant

LISBON URANIUM CORP
304 1st Security Bldg, Salt Lake
City, Utah
Dist Eng: R L Christie
BICE LEASE, U₃O₈
PRYOR MTN MINE, U₃O₈
(See Colo, N Mex, Utah, Wyo)

LUKE, RUSSELL B
1021 E Front St, Butte
JACK PINE PHOSPHATE MINE,
9 mi NE of Elliston, undergr,
Under devel
LUCKE'S SILICA QUARRY, 8 mi W
of Anaconda, open pit

MINERALS ENG CO
MONTANA TUNGSTEN DIV
30 S Montana, Dillon
Pres: Blair Burwell
VP: Ray Sullivan
Gen Supt: E M Craig
Purch Agt: R W Warren
Mine Supt: D E Aro
BROWN'S LAKE MINE, 9 mi NW
of Glen Mill, open pit, WO₃
Idle

CALVERT TUNGSTEN MINE, 7 mi
W of Wise Riv, open pit, WO₃
Prod: 400 tons
CARTER IRON MINE, 8 mi E of
Dillon, Fe
Under devel
1,000-TON FLOT MLL, 5 mi NW
of Glen
(See Colo, N Mex, Utah)

**MINERALS EXPLORATION
DEVEL CO**
Box 41, Bozeman
Pres: Peder Strom
VP: John Jardine
Sec & Gen Mgr: Thomas G McGrath
MINE, (Lease & Bond on various
claims), undergr, placer, Au, Ag,
WO₃
Gen Mgr: T G McGrath
Geol: Emilie Abadie
Mine Supt: Peder Strom

MONTANA GOLD & CEM CO
c/o Montana Chem & Mfg Corp,
325 2nd Ave, Edgemont, S Dak
VP: William J Kinick
RESERVOIR, Gold Creek, Powell
County, placer, Au, Ag
ROGERS HOMESTEAD MINE,
Powell County, Au, Ag
Mine Supt: Alden Trimble

MONTANA IRON MINING CO
P O Box 423, Stanford
Pres: Dewey F Whitaker
VP & Treas: Lemuel G Wingard
Sec: Gail H Whitaker
Purch Agt: Norman Nelson
DEWEY MINE, open pit, Fe
Supt: Norman Nelson
Prod: 1000 tons
MILL, 18 mi S of Stanford

MONTANA MNG & ENGR CO
Box D D, Phillipsburg
Pres & Geol: F S Neal
VP & Sec: E T Irvine
BAGDAD MINE, 29 mi NW of Phillips-
burg, undergr, Au, Ag, Fe
Maps & Surveys: E T Irvine
Mine Supt: F S Neal
Asst Mine Supt: E T Irvine
Idle

MONTANA PHOSPHATE PROD
Garrison
Pres: R B Shelly
ANDERSON MINE, 11 mi NW of
Garrison
GRAVELEY, CIMLET & LUKE MINES,
9 mi NW of Avon, undergr & open pit,
phosphate rock
Gen Supt: F E Burnett
Mine Supt: C W Noon
Mine Frm: C R McDonald, L Brander
Geol: L V Bell
Mine Eng: A M Scott
Prod: 1000 tons

MONTANA MNG & MLG CO
412 Power Block, Helena
VP & Gen Mgr: Jack Vandenberg
Sec-Treas: Jean M Hilmen
VP: Louis Ditchik
EMPIRE GROUP MINE, Hitmen,
Marysville dist, undergr, Au, Ag,
Pb, Cu
Gen Supt: T Vern Miller

Geol: Richard Miller
Prod: 150 tons
FLOT MLL, Hitmen
Under devel

MONTANA RAINBOW MNG CO
Marysville
Owner: W E Wade
Gen Supt: John Brophy
DRUMMOND MINE, Marysville,
undergr, Au
Idle

MONTANA STANDARD MNG CO
Wallace
Pres: Loy L Voss
MONTANA STANDARD MINE, Prospect
Cr dist, Sanders City, Ag, Pb, Zn,
Au, Cu

MUS BECS
Cooke
Ope: R B Mus, V E Mus
BIG BLUE, ST JUDE, GT APT,
undergr, Ag, Pb, Zn
(Hudson-Lease)
Under devel

NANCY LEE MINES, INC
410 Main St, Kellogg, Idaho
IRON MT & NIGHT OWL MINES,
Mineral County, Ag, Cu, Pb
NANCY LEE GROUP, Superior,
undergr, Ag, Cu, Pb, Zn
KING & QUEEN MINES, Ag, Cu, Pb,
Zn
125-TON FLOT MLL
Idle

NAT'L LEAD CO, BAROID DIV
Box 1875, Houston 8, Texas
GREENOUGH PLANT, jigging, grind-
ing
Mine & Mill Supt: J P Murphy
(See Ark, Calif, Kans, La, Mont, Mo,
N Y, Tenn, Tex, Wyo)

NONPAREIL MINING CO
c/o Claude H Bielenberg, Deer Lodge
NON PAREIL MINE, Deer Lodge, 6
mi East of Marysville, undergr, open
pit, Pb, Ag, Au
Idle

NORTH STAR GROUP A
c/o E E Nichols, RFD 1, Toston
BLACKHAWK & NORTHSTAR MINES,
RFD, Toston, undergr, Ag, Au, Pb,
Zn
Under devel

NORTHERN MNG & MLG CO
Ertman
Pres: Paul T Raber
VP: Loren Anderson
Sec: C L Foster (Mng), Wm C Davis
(Mlg)

Treas: P C Bakken
HAWKEYE MINE, Little Rockies dist,
Au, Ag, Cu
RUBY GULCH, Au, Ag, Cu, Pb
(Leased from Gold Reserve Mng Co,
Box 541, Bozeman)

PEURA, LOUIS
1124 6th Ave, Helena
BASIN JOB GROUP, Basin dist, Au,
Ag, Cu, Pb, Zn
HELENA & SILVER COIN MINES,
Scratch Gravel dist, Lewis & Clark
County, Au, Ag, Cu, Pb, Zn
Under devel

HOPE & FAITH MINES, Montana
City dist, Jefferson County, Au, Ag,
Cu, Pb, Zn
Idle

JULIA MINE, Scratch Gravel dist,
Lewis & Clark County, Ag, Cu, Zn
Idle

LIVERPOOL DUMP, Clancy & Lump
Gulch dist, Jefferson County, Ag, Cu,
Pb, Zn
Idle

WHITLATCH MINE, Helena dist,
Lewis & Clark County, Au, Ag, Cu
MORNING STAR MINE, Amazon dist,
Jefferson County, Au, Ag, Pb, Zn
Idle

CLEVELAND MINE, Jefferson City
dist, Au
Idle

NICK & DICK MINE, Canyon Ferry,
undergr, Pb, Ag, Cu
Prod: 10 tons daily

PIONEER CORP
Box 74, Missoula
Pres: J S Barrett
VP: Robert Ferris
Sec-Treas: Jean M Nicholson
COOK MINE, Bonita, Missoula County,
open pit, Mn
Idle
ARROWHEAD MINE, Cramer Cr dist,
Mn

RALLS & HARRIS BROS
Radersburg
IRON CROSS MINE, Broadwater
County, Fe
Prod: 45 tons

RALLS, JOHN M & ELSIE L
Radersburg
NORTH BUTTE MINE, Radersburg,
undergr, Pb, Au, Ag
Under devel

RELYEA, GEORGE A
Box 85, Garrison
RELYEA MINE, 11 mi N of Garrison,
undergr, phosphate
Prod: 3,500 tons
KLINE-SCHMIDT MINE, Winston,
undergr, Pb, Ag, Au, Zn
Gen Supt-Mine Frm: Wm Hendrickson
Idle
Else Idaho

RODON RESEARCH CORP
Boulder
Pres & Purch Agt: Wade V Lewis
VP: Theodore Byquest
Sec-Treas: J T Lewis
URANUM MT MINE, Boulder
INDIANHEAD URANIUM MINE, Basin,
undergr, U₃O₈
Mine Frm: Gilbert Holshoe

ROGERS, NORMAN
Box 1119, Helena
MIKE HORSE MINE, 26 mi E of
Lincoln, undergr, open pit, Ag, Pb
Under devel
(See Utah)

RUSSEN MNG CO
83 E Park, Butte
Pres & Mine Eng: Kenneth M Judd
VP & Gen Mgr: Russell B Luke
Sec-Treas: Harriet Judd
LUKE JUDD SILICA QUARRY, 5
mi W of Anaconda, open pit, silica
Prod: 6,000 tons per year

**SILVER CRESCENT MNG CO
INC**
Box 295, Helena
Pres & Gen Mgr: William A Hall
VP: Louis Peurs
Sec: Albert Lundborg
CRESCENT, PEERLESS & SILVER
CRESCENT MINES, 23 mi S of
Helena, Au, Pb, Ag, Zn, Cu

**SIMPLON CO, J R
FERTILIZER DIV**
Box 512, Pocatello, Idaho
Pres: J R Simplot
VP & Gen Mgr: W Grant Kilbourne
Purch Agt: Paul Lostrom
CENTENNIAL MINE, Monida, 38
mi E of Monida, open pit, phosphate
Res Mgr: P T Peterson
Prod: 3,000 tons
(See Idaho, Nev, Wyo & Warren
Dredging Corp in Idaho)

SWANSEA MINES, INC
Box 904, Helena
Pres & Gen Mgr: C L Hewitt
SILVER BELL MINE, 40 mi NW
of Helena, undergr, Au, Ag, Cu, Pb
Idle

TEXAS-MONTANA MNG CO
Minarch
SILVER BELLE MINE, Montana dist,
Ag, Pb, Zn

TAYLOR-KNAPP CO
Box FF, Phillipsburg
Pres: R R Knapp
VP & Gen Mgr: A V Taylor
Sec & VP: Alf C Kremer
Mgr: Donald S Johnson
Ch Eng: Charles P Knaebel
MOORLIGHT GROUP, TRUE FISSURE
& DURANGO MINE, Phillipsburg,
undergr, Mn, Ag, Zn, Pb, Au
Gen Supt: Jack B McCoy
Geol & Eng: M D Regan
Ch Accountant: Claude Sorensen
Mine Frm: C H Retstad
100-TON GRAY-MAG MLL, Philipe-
burg
Mill Frm: G Kneale
Assay: F S Neal

TRI STATE MINERALS CO
2001 Lincoln St, Ogden, Utah
Own: W K Skeoch
KEYSTONE, TREASURE & SMITH
TALC MINE, Dillon, open pit, Talc
Gen Mgr: J R Fryer
Gen Supt: Ernest Nygren
Geol: C F Joy
Mech Eng: Wm Brown
Prod: 50-75 tons

UMONT MNG CO, INC
504 Silver Bow Bldg, Butte
Pres: L P Evans, Jr
VP: D D Wheeler, Jr
Treas: R H Wodhams
NORWICH MINE, 2 mi W of Butte,
undergr, Mn, Ag
Gen Mgr: D P Wheeler, Jr
Res Mgr: Wilbur F Criswell
Mine Supt: Chas S Bissett
LITTLE SARAH MINE, Summit Valley
dist, Mn

URANIUM CORP OF AMERICA
827 Failing Bldg, Portland 4, Ore
Pres: Graham Griswold
VP: A L Mather
Sec-Treas: Wm F Meyer
DAILY COPPER MINES, Wichee,
undergr, Cu, Pb, Zn, Ag, Au
Mine Supt: Steve J Giulio
Under devel

VARELIA MNG CO
c/o Sam Varelia, 521 Shields
Ave, Butte
EASTERN MINE, Silver Bow dist, Mn
SILVER CLEFT MINE, Summit Valley
dist, Mn

VERILITE MINES INC
Box 132, Hamilton
Pres: Harry R Fishman, Jr
VP: Robert Holt
Sec-Treas: L D Bryson, Asst
Purch Agt: Robert Chamberlain
DONNA-LOU MINE, Box 132, Hamil-
ton, open pit, Vermiculite
Gen Mgr: R Chamberlain
MILL (35 TON), being built at mine
Under devel

VICTOR CHEMICAL WORKS
155 N Wacker Dr, Chicago 6, Ill
Supt: L O Streilmaher
Prod Supt: C Hendrickson
Supt, Mng Oper: Henry Johnson
MINE, Maiden Rock, undergr,
phosphate rock
ELEMENTAL PHOSPHORUS PLANT,
Silver Bow, Electric Furnacing
(See Fla, Ill)

YELLOWSTONE URANIUM CO
Box 518, Hardin
Pres: A A Moser
VP: Dean Cummins
SHAMROCK MINE, Silverstar, undergr,
Cu, Au, Ag
Under devel

YOUNG-MONTANA CORP
2223 1st Ave, Hibbing, Minn
Pres: Joseph Lovall
Sec-Treas: Thomas McCabe
WILLOW CR MINE, Stanford, 18 mi
N of Stanford, open pit, Fe
Mine Frm: Phil Solomson

ZODIAC URANIUM, INC
320 Neas Bldg, Salt Lake City, Utah
Geol: Leland J Davis
Prod near Dillon, Pb, Cu, Au, Ag
Under devel
(See Ariz)

ZONOLITE CO
135 S LaSalle St, Chicago 3, Ill
Pres: J B Myers
VP, Chg Prod: J A Kelley
VERMICULITE MTN MINE, Libby,
open pit, vermiculite concentrates
Gen Mgr: R A Bleich
Asst Gen Mgr: E D Lovick
Geol: R J Kujawa
Mech Eng: D W Robinson
Met: J B Calkins
Purch Agt: B J Dorrington
Mine Supt: R J Kujawa
Mine Frm: Orville Thorne
3,000-TON GRAY MLL, near Libby
Mill Supt: Harold Flatt
Mill Frm: Walter Baker
(See Ill)

NEBRASKA

AMER SMLT & REF CO
OMAHA SMLTR & REFINERY
Omaha
Mgr: Ray C Elow
Gen Supt: C C Schardt
(See Ariz, Calif, Colo, Idaho, Ill, Kans,
Md, Mont, N J, N Mex, N Y, Tex,
Utah, Wash & Federal Mng & Smelting
Co, Mo)

NEVADA

ALLIED OIL & MINERALS CO

409 Ness Bldg, Salt Lake City
Utah
Pres: P C Lyon
Gen Mgr: P C Lyon, Jr
GOLD NOTE MINE, 57 mi S of
Winnemucca, undergr, Pb, Ag, Au,
Zn, Cu
Under devel

AMERICAN CANYON MINES

255 Main St, Lovelock
Own: Harry H Herman
AMERICAN CANYON MINE, Rochester
Mining dist, 8 mi E of Orona in
American Canyon, undergr, open pit,
Hg, Au, Kasilin
Gen Mgr: Harry H Herman, Jr
Asst Gen Mgr: Peter D Wulfschla
Mine Supt: Fred E Noble
Under devel
200-TON GRAY MILL, at mine
REFINERY, at mine
Metal output: 800 lbs of Hg daily

ANACONDA COMPANY, THE
YERINGTON MINES

Box 1000, Weed Heights
Gen Mgr: A E Muller
Asst Gen Mgr: H R Burch
Mine Supt: C J Houch
Plant Supt: A J Gould
Gen Mine Frm: D K Gill
Gen Plant Frm: F M Moninger
Ch Clerk: H L Chesarek
Pers Superv: W H Humphreys
Storekeeper: R K Owen
Master Mech: R E Bentley
Superv Rep & Maint of Mobile Equip:
W M Crook
Ch Elect: M H Hissett
YERINGTON MINE, 81 mi SE of Reno,
surface, Cu
Prod: 12,000 tons
12,000-TON LEACH & PRECIP PLANT
(See Calif, Idaho, Mont, N Mex, N.Y.,
Utah)

APEX MINERALS CORP

317 Clay Peters Bldg, Reno
Pres: Carson Frazzini
VP: Wm Crowell
Sec: Walter Nalmsmith
Purch Agt & Gen Supt: A A Carrey
Gen Mgr: Ben Yoffee
Geol: Phil D Wilson, Harry Hughes
Met: Albert Silver
APEX URANIUM MINE, Austin, U₃O₈
300-TON MILL, Austin

AQUAFIL CO

Box 134, Fernley
Supt: Lowell Smith
AQUAFIL MINE, 35 mi NE of Fernley,
diatomaceous earth
CHICK BED MINE, 27 mi NE of
Fernley, diatomaceous earth
MILL, Fernley

ARGENTUM MNG CO OF
NEVADA

Box 151, Mina
Pres & Purch Agt: E S Gates
VP-Treas: C E Earl
Sec: J A Crowther
Asst Sec: C E Earl
NORTHERN BELLE-HOLMES-MT
DIABLO, Candelaria, undergr, open
pit, Au, Ag, Pb, Zn
Gen Mgr & Metal: E S Gates, Jr
Asst Gen Mgr: Judd Hancock
Gen Supt: C E Earl
Prod: 250 tons
FLOT MILL, Columbus Marsh
Under const

ATLANTA GOLD & URANIUM
CO

Box 248, Pioche
Pres: J E Little
VP & Gen Mgr: C E Colline
Sec-Treas: Wm R Robertson
ATLANTA MINE, 51 mi NW of Pioche,
Atlanta dist, open pit, Au, Ag, U₃O₈
Consult Eng: Roy A Hardy
Under devel

BAKER LAND TRUST

Lida Via Goldpoint
Pres: J S Wisdom
VP: E J Dear
Sec-Treas: Helen Wisdom
Purch Agt: Bob Cosand
BAKER PLACER MINE, Baker, placer,
Zr, Au, Ag, WO₃
Mine Supt: Ole Olsen, Dudley Galley
Asst Mine Supt: Leo Brown
Mine Frm: Edw Schmidt
Under devel

BARIUM PRODUCTS, LTD
(SUBSID OF FOOD MACH &
CIEM CORP)

Battle Mountain
Gen Mgr: G M Stark
Gen Supt: A L Allen
MT SPRINGS & ARGENTA MINE, 22
mi S of Battle Mt, surface, barite
Mine Supt: James Jury
Mine Frm: C N Lauritzen
Prod: 200 tons
(See Barium Products, Calif; Inter-
mountain Chem, Wyo)

BASIC, INC

Box 4, Gabbs
Works Mgr: H P Willard
Mine Supt: A M Dixon
Mill Supt: F W Mensl
Purch Agt: R A McDonald, Jr
GABBS MINE, surface, magnesite,
brucite
Prod: 500 tons
(See Ohio)

BIG FOUR MNG & MLG CO

P O Box 218, Lomita, Calif
MINE, Nipton, open pit
(See Calif)

BLUE DIAMOND CORP

1850 S Alameda St, Los Angeles,
Calif
Pres: N J Redmond
VP: W G Bradley
Sec: T L Donoghue
Purch Agt: B M Martz
BLUE DIAMOND MINE, Blue Diamond
undergr, open pit, gypsum
Gen Mgr: H L Waldhasen
Asst Gen Mgr & Mech Eng: R H White
Elec Eng: Robt Dunnagan
Geol & Supt: Joe Cain
Prod: 1,400 tons
1,400-TON MILL, at mine

BRADLEY MNG CO

660 Market St, Rm 515
San Francisco 4, Calif
Pres: Worthen Bradley
Exec VP: John D Bradley
VP: Jas P Bradley
Sec: G C Orton
GOLDBANKS MINE, Winnemucca,
surface, Hg
Cons Eng: T C Haggood
Leased
(See Calif, Idaho)

BRISTOL SILVER MINES CO

218 Felt Bldg, Salt Lake City 1,
Utah
Pres: George W Snyder
VP: Edward H Snyder
Sec-Treas: C M Christensen
BRISTOL SILVER MINE, Pioche
undergr, Cu, Ag, Pb, Zn, Au, Mn
Gen Mgr: Byron S Hardie
Gen Supt: Harry Pollar
Purch Agt: Hoyt Adair
Prod: 55 tons

COLUMBIA MINE

Box 1288, Ely
Gen Mgr: Sam M Robison
MINES, 1 mi E of Ruth, undergr,
Mn, Zn, Pb, Cu, Au, Ag
Producing
GRAY MILL

COMBINED METALS
REDUCTION CO, NEVADA
OPERATIONS

Pioche
Gen Mgr: Paul Gemmlich
Asst Mgr: H E Swanson
Gen Mine Supt: R G Lee
CASELTON MINE, 3 mi W of Pioche
undergr, Zn, Pb, Ag, Mn
Mine Frm: J L Stewart
Idle

COMET MINE, 20 mi W of Pioche,
undergr, Zn, Pb, Ag, WO₃

Idle
700-TON CASELTON MILL, FLOT-
HMS, Zn, Pb, Ag, Mn
400-TON PANACALITE MILL,
Crushing & grinding, crude perlite
(See Utah)

COMSTOCK URANIUM & OIL
CORP

21 Phillips Petroleum Bldg,
Salt Lake City, Utah
BRETT MERCURY MINE/ARENTEZ-
COMSTOCK MNG VENTURE,
(See Oreg, Utah)

CONSOL COPPERMINES CORP

Kimberly
Gen Mgr, Explor: Arthur J O'Connor
(Nevada properties purchased by
Kennecott Copper Corp, See N.Y.)

CONSOL EUREKA MNG CO

Eureka
Gen Mgr: Sherman B Hinchley
Asst Gen Mgr & Mine Supt: Dean P
Thriot
DIAMOND MINE, 2 mi from Eureka,
undergr, Pb, Ag, Au
Prod: 25-30 tons
(See Utah)

COPPER HILL MINE

1235 Palisade Drive, Reno
Own: Harve P Nelson, James C,
Schenk, Robert C Schenk
COPPER HILL MINE, 18 mi N of
Reno, undergr, open pit, Cu, WO₃
Idle

CORDERO MNG CO

131 University Ave, Palo Alto, Calif
VP: S H Williston
CORDERO MINE, McDermitt, 12 mi
SW of McDermitt, undergr, Hg
Gen Mgr: J Eldon Gilbert
Asst Gen Mgr: Verne P Haas
Gen Supt: Bert Mitchell
Supt: Cliff Allig
100-TON MILL, at mine
RETORT FURNACE, at mine
(See Calif, Idaho, Oreg)

COURVOISIER, CHAS H (OWN)

Box 470, Susanville, Calif
TICK CANYON MINE, Washoe County,
undergr, U₃O₈
Gen Mgr & Mine Supt: A G Van Galder
Under devel

DAKIN, FRED H

2811 Hillside Dr, Burlingame, Calif
CERVANTITE MINE, 23 mi E of
Lovelock, undergr, Sb
Idle

DE LONGCHAMPS, F J

Box 2244, Reno
TALAPOOSA MINE, 15 mi S of
Fernley, Au, Ag
Idle

DODGE CONSTRUCTION, INC

Box 268, Lovelock
MINE, 25 mi SE of Lovelock, open
pit, Fe
Supt: Frank H Dana

EAGLE-PICHER CO

INSUL DIV
Box 1859, Reno
Gen Mgr: John W Kenney, Jr
Asst Gen Mgr: Milton S Steinhilber
CELATOM MINE, Clark Station, open
pit, diatomaceous earth
Mine Supt: H C Smith
MILL, Air classification, at mine
Mill Supt: Frank J Dodick
(See Ill, Kans, Ohio, Okla, Wis)

EDGEMONT MNG CO

Tuscarora
Gen Mgr: T C Hedlund
EDGEMONT MINE, undergr, Au
Under devel

ELY VALLEY MINES, INC

Pioche
Pres & Gen Mgr: John Janney
Sec: Sherman Hickman
Supt: Bruce Condie
ELY VALLEY MINE, undergr, Zn, Pb
Idle

ERRINGTON-THIEL MNG CO

Ruby Valley
Part: Oscar W Thiel
Mrs Alma T Errington
BIG MICA MINE, Ruby Valley, 65 mi
SW of Wells, undergr & surface, ruby
mica, beryl, rare minerals
HOLIDAY COPPER MINE, 50 mi S
of Wells, undergr & surface, Cu,
Zn, rare minerals
Under devel

EUREKA CORPORATION, LTD

Eureka
Pres: A J Anderson
VP & Man Dir: Neil O'Donnell
Sec: A C Callow
Treas: P W Zechhausen
Purch Agt: Willis A DePaoli
RICHMOND-EUREKA MINE, 2 mi W
of Eureka, undergr, Pb, Au, Ag, Zn
Gen Supt: Robert N Breckenridge
Mine Supt: Vernon Mans
Mine Eng: Walter Paroni

FAIRHAVEN URANIUM MINES

INC
Box 261, Lovelock
Pres & Gen Mgr: Gene Jack
VP: Fred M Jaquith
Sec-Treas: B M Andrews

LINCOLN HILL MINE, Rochester
Mng dist via Orona, 20 mi E of Love-
lock, undergr, U₃O₈, Au, Ag
Mine Frm: Ernest Albrecht
Under devel

FIBREBOARD PAPER PROD
CORP (FORMERLY PASCO
PRODUCTS, INC)

Box 2035, Henderson
WHITE EAGLE MINE, 8 mi NW of
Henderson, open pit, gypsum
Supt: Geo A Mayer
MILL, at mine

GABBS EXPLORATION CO

Drawer 1, Gabbs
Pres: Lee D Dougan
VP: Ellen M Dougan
VICTORY TUNGSTEN MINE, 6 mi
N of Gabbs, undergr, scheelite
Mine Frm: Charles Bentz
Prod: 100 tons
100-TON GRAV-FLOT MILL, Gabbs
Mill Supt: W M Dougan
Idle

GARDNER MINES

Box 413, Ely
Gen Mgr: C A Gardner
MINERAL FARM & MERRIMAR GPS,
20 mi SE of Ely, undergr, Au, Ag,
Pb, Zn
Prod: 5 tons

GETCHELL MINE, INC

Box 2520, Reno
Pres: George Wingfield
VP & Gen Mgr: N H Getchell
VP & Cons Eng: B A Hardy
Sec-Treas: T L Wilcox
Gen Supt: Keith Kunze
GETCHELL MINE, Golconda,
undergr & surface, WO₃
Mine Supt: Wm J Newman
Asst Mine Supt: Elmer Snell
Met: Roy Nojima
Prod: 900 tons
1,500-TON FLOT MILL, near Golconda
Mill Frm: David Kiesel
Idle

GOLDFIELD CONSOL MINES
CO

Box 2520, Reno
Pres: George Wingfield
Exec VP: Willis A Swan
Sec-Treas: Geo M Spradling
(See Calif, Wash)

GRAND DEPOSIT MNG CO

409 Ness Bldg, Salt Lake City,
Utah
GRAND DEPOSIT MINE, Ely,
undergr, Pb, Zn, Cu, Ag, Au
Gen Supt: Paul C Lyon, Jr
Idle

GRANDVIEW MNG & MLG CO

Goldpoint
Pres & Gen Mgr: J S Wisdom
VP & Sec: Helen Wisdom
Treas: E J Dear
Purch Agt: Bob Cosand
Geol: Karl Desselhorf
Met: E Eisenhower
GRANDVIEW MINE, Oasis, undergr,
open pit, Au, Ag, WO₃, Pb, Zn,
Cu, Talc
Mine Supt: Smoke Smith
Asst Mine Supt: Jack Fouch
Mine Frm: B C Boone
Prod: 20 tons

PALMETTO MINE, Palmetto, Talc

(Cosmetic grade)
WELLINGTONS MINE, Tule Canyon,
undergr, open pit, stellite-cosmetic-
pharmaceutical talcs, ceramic talc
Mine Supt: Bill Sutton
Mine Frm: Frank Gomez
Idle

15-TON GRAY MILL, Palmetto

Idle

GRANO-LITE GOLD MNG CO

Box 337, Yerington
Pres & Gen Mgr: W E Slater
VP: John W Barrett
Sec-Treas: Lynne L Turner
GRANO-LITE URANIUM MINE, 17
mi SE of Wellington, undergr, U₃O₈
Idle

INDUSTRIAL MINERALS &
CHEMICAL CO

6th and Gilman Sts, Berkeley 10,
California
Pres: L R Moretti
VP: W S Cowgill
Sec-Treas: A L Forbes
JUPITER MINE, Lyon County, open
pit, clay
(See Calif)

Nevada

ISBELL CONST CO

Box 2381, Reno
Pres: C V Isbell
Ch Eng: H R Noel
Purch Agt: W J Henley
THREE KIDS MINE, open pit, contract
mg for Manganese, Inc
Supt: Lloyd Sampson
(See Ariz, Idaho, Utah, Wash)

KENNECOTT COPPER CORP
NEVADA MINES DIV

McGill
Gen Mgr: J C Kinsner, Jr
Asst Gen Mgr: M J O'Shaughnessy
Purch Agt: W N Ireland
Div Controller: R W Crosser
RUTH PIT, VETERAN MINE, Ruth,
open pit, Cu, Au, Ag, MoS
Pit Supt: Frank Quillien
Asst Ch Eng: L A Green
DEEP RUTH MINE, Ruth, undergr.,
Cu, Au, Ag, MoS
Undergr Mine Supt: R C Nisapel
21,000-TON FLOT CONCENTRATOR,
2 REVERB SMELTERS, McGill
Concn Supt: W J Albert
Smelt Supt: E Pesout
Mech-Elect Supt: W K Sanders
Prod: 100,000,000 lbs Cu yrlly
NEVADA NORTHERN RY (Subsid)
Gen Supt: H M Peterson
TRIPP COPPER PIT & INTERESTS
IN LIBERTY PIT & VETERAN,
Kimberly (Purchased from Consoli-
dated Coppermines Corp, Kimberly)
(See Ariz, N Mex, N Y, Utah)

L & N MNG CO

1129 10th Ave N, Seattle 2, Wash
Pres: W J Logus
TRENTON CANYON COPPER MINE,
Battle Mt, undergr, open pit, Cu, Ag,
Pb, WO₃
Gen Supt: V R Newbury
Geol: Forbes Robertson
Under devel
(See Wash)

LONDON EXTENSION MNG CO

Beowawe
Pres: Fred C Bishop
VP: R W Fraser
Sec & Gen Mgr: H C Bishop, Jr
Supt & Treas: R B Warmbrodt
GOLDACRES MINE, 38 mi S of
Beowawe, surface, Au, Ag
Supt: E E Mahoney
Mine Frm: Angelo Masconi
Prod: 450 tons
450-TON CYAN MILL, at mine
Supt: C E Stewart
Asst Supt: Harold Bohi

LOWARY URANIUM MINE CO

680 Mt Rose St, Reno
Pres: Howard E Mass
Sec-Treas: Belle Lowary
LOWARY URANIUM MINE, open pit,
Prod: 150 tons
Under devel

LUCKY-9 URANIUM INC

4275 Neil Rd, Reno
Pres: F A Denton
VP: Grant McCoy
Sec: Mary Agnes Denton
Treas: Dorothy Bridgman
LUCKY-9 MINE, Yerington, undergr,
surface, U₃O₈, Ag, Au, Cu
Gen Mgr-Asst Mine Supt: R F Denton
Geol: Arthur Lakes
100-TON FLOT MILL, Antelope Mng
dist

MAGNET COVE BARIUM CO

Beowawe
FIVE PITTS, 23 mi S of Beowawe,
surface, crude barite
(Leased from Beowawe Barium Prod
Assn)
(See Ark, Tex, Wyo, Mo, Fla)

MANGANESE, INC

Box 2008, Henderson
Pres: Wm M Weaver, Jr
VP: F A McGonigle
Sec: Hewitt S West
Treas: J F Willmott
Ch Met: Ellis Gates
Gen Supt: Robert A Blake
Purch Agt: L D Richardson
Gen Mgr: William Kendrick
THREE KIDS MINE, 6 mi E of
Henderson, surface, Mn
Mine Supt: Victor Howard
Ch Plant Eng: R Waters
Mine Eng: C Hawkins
Elec Eng: Russell Fritch
Controller: H M Alarid
Prod: 1,000 tons
1,000-TON FLOT MILL, at mine
Mill Supt: Ed Lowman
(See NY)

METALLURGICAL DEVEL
CO, INC

P O Box 101, Gardnerville
Pres: Emory W Grambs
VP: Joe Micheo
Sec-Treas: Paul Laxalt
MINE, 12 mi E of Gardnerville
Pinehut dist, Pb, Ag, WO₃
SOUTHERN PACIFIC LEASE-
ORE, Lovelock, open pit, Fe
100-TON FLOT-ORAV MILL, at mine
Mill Supt: Joe C Morris
Idle

MINERAL MATERIALS CO

1145 Westminster Ave,
Alhambra, Calif
Gen Mgr: C W Danton
Ch Eng: M W Rodhead
Geol: W M LaBounty
Mine Supt: M C Graham
Mine Mgr: F W Leidick
Mine Frm: C W Butler
800-TON MILL, at mine, jaw crusher,
rolls, magnetic separators
Mill Frm: G C Rawlins
BUENA VISTA MINE, Lovelock,
surface, Fe
Prod: 800 tons
(See Calif)

MINERVA SCHEELITE MNG CO

Box 901, Ely
Gen Mgr: R Stopper
SCHEELITE CHIEF, 50 mi SE of
Ely, undergr, WO₃
Idle
35-TON GRAV MILL, 48 mi SE of
Ely

N & M MINING CO

Idle
Pres: H P Newman
Sec: Ed R Moore
Treas: D A Newman
COPPER KING GROUP, 3 mi S of
Idle, undergr, Cu
Under devel

NATIONAL MERCURY CORP

235 Main St, Lovelock
Pres: Harry H Herman, Jr
VP: David L Wulfschohn
Sec-Treas: Peter D Wulfschohn
PERSHING QUICKSILVER MINE, 22
mi E of Lovelock, Antelope Springs
dist, undergr, Hg
Dir of Mng Oper: Peter D Wulfschohn
Gen Mgr: Harry H Herman, Jr
Idle
REFINERY, at mine
Prod: 1,400 lbs daily

NEVADA IRON ORE CO, INC

Lovelock
Pres: H S Thomas
MINE, 25 mi E of Lovelock, Buena
Vista dist, open pit, Fe
(Leased from Southern Pacific Co)

NEVADA PARK MNG CO

P O Box 37, Provo, Utah
Sec-Treas: Richard Knight
MINE, Silver Park Mng dist, Lincoln
County, undergr, Au, Ag
Idle
(See Utah)

NEVADA-MASSACHUSETTS CO

Tungsten
Pres: C H Segerstrom
VP: M D Cronwall
Treas: M D Jones
Gen Mgr: E Nash
TUNGSTEN MINE, 9 mi N of Mill
City, undergr & surface, WO₃
Mine Supt: D O'Keefe
Mine Eng: Ralph Cronning
Part-time
600-TON GRAV-FLOT MILL
Mill Supt: J R Caldwell
Assayer: R V Noble

NEVADA PERLITE CO

1414 Industrial Road, Las Vegas
Pres: James H Bradford
VP: J A Tiberti
Sec-Treas: George Von Tobel
PERLITE PROCESSING PLANT,
Las Vegas
Capacity: 10,000 cu ft expanded
perlite per day

NEVADA SCHEELITE CORP

(Subsid of KENNAMETAL INC)
430 S Main St, Fallon
Pres: Donald C McKenna
VP & Gen Supt: E M Colwell
Asst Sec & Purch Agt: Geraldine
Marsh
Acct: Monte Leveaux
Geol & Asst Supt: Jack Frank
Mech Eng: K L Colwell

NEVADA SCHEELITE MINE,

Rawhide, undergr, WO₃
Mine Supt: Harry Manny
Prod: 140 tons
150-TON GRAV-FLOT MILL, at
mine
Mill Supt: Mark Campbell

NEVADA TUNGSTEN &
URANIUM INC

19 Friedman Bldg, Las Vegas
Pres & Gen Mgr: J Dewey Solomon
VP: O Polodaro
Sec-Asst Gen Mgr: Dave Silverman
Treas: Fred Gillies
Purch Agt & Geol: James Solomon
BROKEN RIDGE MINE, Overton,
undergr, open pit, Th, Carnotite
Gen Supt: Jack Tappan
Under devel

NORTH STANDARD MNG CO

Box 605, Provo, Utah
Pres & Gen Mgr: Garth W Manson
Sec: Robert E Eyre
NORTH STANDARD MINE, 25 mi NW
of Naturita, Montrose County, U₃O₈
Mine Frm: Melvin R Conley
Under devel

PETERSON, M F & LORENA

Box 131, Tonopah
OLD COWGIRL MINE, 50 mi NE of
Tonopah, undergr, Au, Ag
Under devel
M & M (MERCURY MT) MINE,
47 mi NE of Tonopah, undergr, Hg
(Optioned to Two States, Uranium
Company, Bountiful, Utah)

RED ROCK MINE CO

Fish Lake Valley, Tonopah
Parts: K L Hill, Ray Puccetti,
Emory Belt, Lewis Pelham
Geo Scott
MINE, open pit, Hg
30-TON GRAV MILL, at mine

RIECK, H R & HOALST,

BLAINE
Battle Mountain
SILVER CHIEF MINE, 5 mi NE of
Battle Mt, undergr, open pit, Ag,
Pb, Au
Under devel
MONDAY MINE, Battle Mt, undergr,
Au, Ag, Pb
Under devel

RIECK, H R & LAURITZEN

Battle Mt
OVERLOOK CLAIMS (6), 5 mi W of
Battle Mt, undergr, surface, Co,
Ni, Cu, Ag, Au, Pb
Under devel

ROBISON, SAM M & SON

Box 1288, Ely
Gen Mgr: Sam M Robison
Asst Gen Mgr: Donald M Robison
COLUMBIA & KEYSTONE MINE,
1 mi E of Ruth, undergr, surface,
Zn, Pb, Cu, Au, Ag, Mn
ROBISON URANIUM MINES, Atlanta,
U₃O₈
Idle
EAGLE MINE, Lincoln County, 100
mi S of Ely, U₃O₈
Idle
ROBISON MINES, 1 mi N of Ely,
undergr, Zn, Cu, Pb, Ag
Idle

ROUND MTN GOLD DREDGING

CORP
Round Mountain
Mgr: Sherman Burdick
PLACERS & MILL, 60 mi N of Tonopah
Supt: Burton Scheetle
(Leased from Nevada Prophyry Gold
Mines, Inc, 10 W 2nd St, Reno)

RUGGLES, A L & SONS

Cherry Creek
LAUGHING INDIAN GROUP, 3 mi S
of Cherry Creek in Egan Canyon,
undergr, WO₃
Under devel
KICHEQUER GROUP, 4 mi NW of
Cherry Creek, undergr & placer,
Scheelite, Au, Ag
URANIUM CLAIMS, Telegraph mng
dist
Under devel

J R SIMPLOT CO, FERTILIZER

DIV
Box 912, Pocatello, Idaho
VP & Gen Mgr: W Grant Kilbourne
Purch Agt: Paul Lostrom
SIMPLOT IRON MINE, 26 mi S of
Pallade, open pit, Fe
Mine Mgr: John Kobe
Idle

SIMPLOT SILICA PRODUCTS, INC

Overton
Mgr: Keith Madell
(See Idaho, Mont, Wyo)

SISKON CORP

422 Gazette Building, Reno
Pres: H B Chessher, Sr
VP: E J Schrader
Sec-Treas: J E Chessher
AMERICAN EAGLE, GLOBE, OLD
RELIABLE & PRINCE MINES
(See Ariz, Calif)

STANDARD SLAG CO

Box 3, Gabbs
Pres: L A Beeghly
VP: W E Bliss
Sec-Treas: W H Kilcawley
Western Mgr: R O Jones
GREENSTONE MINE, 2 mi E of
Gabbs, surface, magnesite
Supt: G B Gaylord
Frm: A C Wood
Prod: 500 tons
300-TON GREENSTONE MILL,
Gabbs, Calcining
Frm: W C Barnett
IRON MT MINE, Gabbs, open pit,
Fe
Prod: 700 tons
Mine Supt: G B Gaylord
Frm: C R Corlett
MINNESOTA MINE, Yerington, open
pit, Fe
Prod: 1,000 tons
Supt: J R Harmon
(See Ohio)

STORMY DAY MINES

435 Hillcrest Rd, San Mateo, Calif
Pres: Robert N Avery
VP: Alfred W Stickney
Sec: M J Scholz
STORMY DAY MINE, Pershing City,
undergr, WO₃
Idle

SUMMIT KING MINES, LTD

Box 622, Fallon
Pres: Ira B Joralemon
Gen Mgr: Percy G Dobson
Explor

SUNBURST URANIUM

CORPORATION
1975 NW Everett St, Portland 9,
Oreg
MONARCH CLAIMS, Nye County U₃O₈
Idle
TRADER HORN MINE, Box 968,
Tonopah, Nye County, undergr, Au,
Ag
Gen Mgrs: J C Young, K Critchlow
Under devel
ANTELOPE MINE, Washoe County,
Open pit, Hg
Under devel
(See Oreg, Utah)

TRIANGLE MINES CO, INC

416 Bridge St, Winnemucca
TRIANGLE MINE, 70 mi NW of
Winnemucca, Bottle Creek dist,
open pit, Hg
Supt: Harry Trollope
FLOT-MILL, at mine

TUNGSTEN MT MNG CO

511 Securities Bldg, Seattle 1,
Wash
Pres: Bennett W Carter
VP: Emil Motzinas
Sec: F L Mills
MINE, Clin Alpine Dist, undergr,
WO₃
Supt: Walter E Deighton
Geol: Arthur Lakes
Under devel

UNALDE LEASE

1975 Palisade Dr, Reno
Oper-Mgr: John H Unalde
ALLADIN MINE, 26 mi SW of Elko,
undergr, Pb, Ag, Cu
Under devel
BONNE MINE, 26 mi SW of Elko,
undergr, Cu, Ag
Under devel

U S LIME PROD CORP

Box 127, Henderson
Hew Mgr: John MacDonald
SLOAN MINE, Sloan, Box A, open
pit, dolomite
Gen Supt: Wm E Ellis
Supt: Geo Rodriguez
Prod: 800 tons
190-TON MILL, Sikan
AFEX MINE, Box 568, N Las Vegas,
open pit
Supt: C R Prince
Frm: John Sanger

Prod: 3,000 tons
250-TON MILL, Henderson
Supt: Wm B Malnor
(See Ariz, Calif)

WAN CHANG MNG CORP.
LINCOLN MINES DIV
Gen Mgr: J J Struzel, Jr
Asst Gen Mgr: George Reed
LINCOLN MINE, Tempe, undergr.
WO₂
Gen Supt: Ed Woods
Asst Gen Supt: John Russell
Purch Agt: Wm F Spain
Mech Eng: Charles Wilson
Met: Phil McGuire
Mine Supt: Al Nielson

Idle
700-TON GRAV-FLOT MILL, at mine.
Supt: Allen Hunt
(See Calif, Colo, NY, Tex, & E.A. Scholz
& J.H. Casler, Ariz)

WESTMINSTER CORP
416-20 1st Nat'l Bank Bldg,
Denver, Colo
Pres: David W Adams
VP: Melvin C Bowles
VP & Treas: T.R. Llewellyn
Sec: Jim T Holman
PYRAMID LAKE PROPERTIES,
Washoe County, U₃O₈
Under devel
(See Ariz, Colo, Utah, Wyo)

WHELCHER MINES CO
1019 Arthur St, Caldwell, Idaho
Pres: William E Whelchel
VP: Ralph A Whelchel
Sec-Treas: Thressa M Whelchel
NATIONAL MINE, McDermitt, Av,
Id
(Under devel)
(See Utah)

WHITE CAPS GOLD MNG CO
317 Clay Peters Bldg, 140 N
Virginia, Reno
Pres: Carson Frazini
Sec-Treas: Walter Naismith
WHITE CAPS MINE, Manhattan, Av,
Sb, Nc
Gen Mgr: Hugh Cameron
Gen Supt: George Rounds
Geol & Met: Albert Silver
Under devel
150-TON CYAN MILL, Manhattan

YOUNG AND CRITCHLOW
1976 NW Everett St, Portland 8,
Oreg
Own: James C Young, Kay Critchlow
COALDALE PROPERTY, Esmeralda
County near Coal Dale, undergr, U₃O₈
Idle

NEW HAMPSHIRE

FOOTE MINERAL CO
18 W Chelton Ave, Philadelphia 44,
Pa
COLD RIVER MINE, Bellows Falls,
at Cold Riv, undergr, feldspar
Gen Mgr: George Kneass, Jr
(See NC, Pa, Va)

WHITEHALL CO, INC
445 Park Ave, New York 22, N.Y.
Pres: V D Dardi
Exec VP & Treas: Harry S Adams
VP & Purch Agt: P B Verplanck
VP: Jay E Rand
Sec: D F Cunningham, Jr
RUGGLES MINE, Grafton, surface
feldspar, mica, beryl, apodumene
Prod: 30 tons

NEW JERSEY

ALAN WOOD STEEL CO
Dover
Pres: H R Wood
VP, Oper: W E Boger
Sec: W B Cashmore
Treas: W M Webb
Purch Agt: Clinton Bishop
SCRUB OAKS MINE, Mine Hill,
undergr, Fe
Supt: J P Keritu
Gen Mine Frm: K Sherbok
Mine Frm: S J Uskovic
Mine Eng: L V Meyers
Master Mech: Joseph Spetcher
3,500-TON GRAV-MAGNETIC MILL,

at mine
Gen Mill Frm: N K Karchmer
Chem: W F McDougal
WASHINGTON MINE, Oxford, under-
gr, Fe
Supt: W J Keats

AMER SMLTG & REFIN CO
Barber
PERTH AMBOY PLANT
Mgr: G H Wells
Gen Supt: C B Porter
(See Ariz, Calif, Colo, Idaho, Ill,
Kans, Md, Mont, Nebr, N Mex, N Y,
Tex, Utah, Wash, & Federal Mng &
Smelting Company, Mo)

NEW JERSEY ZINC CO, THE
160 Front St, New York 38, N.Y.
Ch of Bld: H Hadenbergh
Pres: R L McCann
VP, Mng & Explor: S S Goodwin
Mgr, Purch: W C Dunlap
MINES, Ogdensburg, Zn
Gen Supt: D McKechnie
(See Colo, N Mex, N Y, Pa, Tenn,
Va, Wisc)

RICHARD ORE CO, SUBSID
COLO FUEL & IRON CORP
Wharton
RICHARD MINE, near Wharton,
undergr, Fe
Supt: Martin Brophy
Safety Eng: W P Galligan
Mech Eng: J J Burchko
Elec Eng: George Gawthorn
Elec: Harry Martin
600-TON MAGNETIC MILL
Supt: P W Keim

SHAHMOON INDUSTRIES, INC
MT HOPE MNG DIV
Box 392, Dover
MT HOPE MINE, undergr, magnetite
Gen Supt: Harold Christy
Ch Eng & Geol: Robert Hagerman
Office Mgr: Laurence James
Mine Capt: Howard Buckingham
Prod: 3,000 tons
1,500-TON FLOT MILL, at mine
Frm: Preston Davenport
Assay: Wooten J East

U S METALS REF CO
(Subsidi of AMER METAL CLIMAX, INC)
81 Broadway, New York 6, N.Y.
Pres: Hugo de Neville
VP: E T Rise, L. Col, F H Dyke
H A Vogelstein, J Vuilleumier,
J Payne, Jr
Sec & Asst Treas: E A Weill
Treas: Donald J Donahue
Purch Agt: D Kelther
Control: H C Cohen
ELECTROLYTIC SMELTER &
REFINERY, Carters
Gen Mgr: Freeman H Dyke
Asst Mgr: Douglas Tennant
Prod: 150,000 tons Cu per year
25,000,000 oz Ag per year
600,000 oz Au per year
(See Mich & Amer Metal Climax, Inc,
NY)

NEW MEXICO

AMBROSIA MINERALS, INC
763 First Nat'l Bk Bldg,
Phoenix, Ariz
LUCKY STRIKE NO 2 MINE, Socorro
County, open pit, Mn
Idle
(See Ariz)

**AMERICAN SMELTING &
REFINING CO**
SOUTHWESTERN DIVISION
813 Valley Nat'l Bank Bldg
Tucson, Arizona

Mgr: T A Suedden
Asst Mgr: A C Hall
Ch Geol: Kenyon Richard
GROUND HOG UNIT, Vanadium,
New Mex, undergr, Pb, Zn
Supt: L H Chapman
Idle
DEMING MNG UNIT
800-TON FLOT PLANT
Supt: B L Rickman
(See Ariz, Calif, Colo, Idaho, Ill, Kans,
Mont, Nebr, N J, N Y, Tex, Utah, Wash,
& Federal Mng & Smelting Co, Mo)

ANACONDA COMPANY, THE
NEW MEXICO OPERATIONS
Box 638, Grants
Mgr: A J Fitch

Asst Mgr: E C Peterson
Gen Mill Supt: W J Roberts
Asst Mill Supt: T R Beck, A K Veeder,
W R Stern
Ch Met: Dale C Matthews
Asst Ch Met: J H Glover
Mine Supt: John P Herndon
Asst Mine Supt: Floyd Ballentine
Ch Geol: R D Lynn
Mech Supt: T M Fitch
Ch Chem: Jack R Pate
Ch Pilot: Woodrow B House
Ch Clerk: F G Holmberg
Asst Ch Clerk: George Hankinson
Storekeeper: R L Millard
Gen Frm, Crush & Handling Dept:
Amos Leach
Supt, Acid Gen Plant: Wayne Hickson
Ch Elect: M D Barnaby
Frm, Jackpile Mine: B F Barlow,
Stanley Whitty
JACKPILE MINE, open pit, Uranium
Ore
Prod: 3500 tons
SECTION 9 MINE, open pit, Uranium
Ore
Prod: 50-75 tons
SECTION 33 MINE, undergr, Uranium
Ore
Under devel
-3000-TON LEACHING PRECIP MILL,
Blawater
(See Calif, Idaho, Mont, Nev, N.Y., Utah)

ANDERSON SROS CORP
600 Coal Ave, SW, Albuquerque
MANGANESE CHIEF MINE, Socorro
County, Mn
Supt: Ray C Wood
MILL, 25 mi SW of Socorro
Under construction

BANNER MINING CO
2042 Conner Stravenue, Tucson,
Ariz
Pres: E S Bowman
VP: L L Travis, John M Wallace
VP & Gen Mgr: A B Bowmah
Sec-Treas: James E Hogle
Purch Agt: E C Bowman
BONEY-MANILA & MISER'S CHEST
MINES, Lordsburg, undergr, Cu,
Ag, Au
Gen Supt: F M Bowman
Mine Supt: Coleman Dunkerson
Master Mech: Arthur B Smith
Under devel
400-TON FLOT MILL, at mine
Mill Supt: Fred E Johnson
Assayer: Harold L Cox
(See Ariz)

BLACK RANGE MNG CO
Kingston
Pres: J H Shoonmaker
SILVER TAIL GROUP & SILVER QUEEN
GROUP, Sierra County, Ag, Pb, Au,
WO₂
Geol: Dr Howard A Meyerhoff
Under devel
COPPER QUEEN, JACK RAT GROUPS,
undergr, Ag, Pb, Zn, Au, Cu
Under devel

BROWN & WALLACE
501 Park Ave, Astec
Pres: A R Wallace
VP: M R Wallace
Sec-Treas: Creighton Brown
BOBCAT MINE, open pit, U₃O₈
Gen Mgr: Don Wallace
Asst Gen Mgr: Billy Ross Wallace
Under devel

CALUMET & HECLA, INC
1 Calumet Ave, Calumet, Mich
VP & Gen Mgr: A S Kromer
EXPLORATION OFFICE, 308 Val Verde
SE, Albuquerque
Party Chief: R W Killebenstein
Geol: T A Boyden
URANIUM DIV, Box 908, Grants
Branch Mgr: George McKereghan
Office Mgr: J H Doyle
Geol: R W Weege
MARQUEZ MINE, Ambrosia Lake,
undergr, U₃O₈
Under devel
(See Ill, Mich, N.Y.)

CAPITOL-SEABOARD CORP
Box 1847, Farmington
Gen Mgr: Charles W Yetter
JETER (CHARLIE #2) MINE, Ladrón
Mn, Socorro County, U₃O₈, V₂O₅
Prod: 30 tons
(Leased to Uteco Uranium Corp, Belen)
(See Ariz, Idaho, Mont, Texas, Utah)

DALCO URANIUM, INC
Uranium Center Bldg, Grand Junction,
Colo
Gen Mgr: E E Lewis

New Hampshire — New Mexico

DALCO NO 1 MNE, Grants, undergr,
U₃O₈
Prod: 100 tons
(Leased from Mid-Continent Uranium
Corp, Grand Junction, Colo)

DENNIS & FIFE
Cameron
Pres: Lloyd T Dennis
GOOD LUCK MINE, Cameron, undergr,
U₃O₈, Cu
Prod: 10 tons
Under devel

DUVAL SULPHUR & POTASH
CO, POTASH DIV
Box 510, Carlsbad
Res Mgr: J E Tong
Asst Res Mgr: J W Borskey
Ch Eng: B F McGuire
Safety Eng: C E Childers
Purch Agt: J R Smith
MINE, 21 mi NE of Carlsbad, undergr,
potash
Prod: 3,000 tons
Mine Supt: R H Taylor
Mine Frm: J J Gasparich
Mine Eng: H L Shively
FLOT MILL
Mill Supt: D J Bourne
Mill Frm: M H Harrison
(See Ariz, Tex)

ELAYER CO, INC
Box 1058, Silver City
Pres & Gen Mgr: C E Clayer
LINCHBURG MINE, Socorro County,
Pb, Ag, Zn

FARM CHEMICAL RESOURCES
DEVEL CORP
602 W Greens St, P O Box 870,
Carlsbad
Pres & Gen Mgr: E F Kindavee
VP: G J Talbott, D A McGee
Sec: C F Brannan
Treas: L A Woodward
Purch Agt: W G Hensley (Acting)
Chmn of Bd: J G Patton
POTASH MINE, Eddy & Lea Counties
near Artesia
Under devel
(Joint venture of Kerr-McGee, Phillips
Petroleum Co & Nat'l Farmers Union)

FOUR CORNERS EXPLOR CO
Box 118, Grants
Gen Mgr: Irving Rapaport
Asst Gen Mgr: Forrest Fincher
Mng Eng: Robert Kirchman
Off Mgr: Clayton Langlais
PROPERTIES, Grants, Ambrosia
Lake, U₃O₈
Mine Supt: Roscoe Riddle
Prod: 40 tons
DOG MINE, McKinley County, U₃O₈
(See Colo)

GREAT LAKES CARBON CORP
Box X, Socorro
Pres: Geo Skakel, Jr
VP, Perlite Div: D L Martlett
BLANCA VISTA MINE, 4 mi W of
Socorro, surface, perlite
Supt: Jerry Howell
Ch Geol: J W Reinhardt
MILL, Socorro
(See Calif, Colo, Nev, N.Y., Oreg)

HAYSTACK MT DEVEL CO,
(A SUBSID OF SANTA FE RY
CO)
80 E Jackson Blvd, Chicago 4, Ill
Pres: F G Gurlay
VP: R Q Rydin
Sec-Treas: C A Menninger
Purch Agt: F J Steinberger
HAYSTACK & POISON CANYON
MINES, Prewitt, open pit, U₃O₈,
V₂O₅
Ch Mng Eng: T O Evans
Sen Mng Eng: C E Stauder, Jr
Prod: 400 tons
SECTION 23-13-10 & SECTION 23-13-10
MINES, McKinley County, U₃O₈

HOLLY MINERALS CORP
340 Third St SW, Albuquerque
Pres: A H McRae
VP & Gen Mgr: J G Heaston
DEACON HILL MINE, 322 W Santa Fe,
Grants, undergr, U₃O₈
Supt: W A Palmer
Idle
BUCKY #1 MINE, Grants, U₃O₈
FLAT TOP MINE, Grants, U₃O₈
Idle
MESA TOP MINE, Grants, U₃O₈
(See Idaho, N.Y.)

HOMESTEAK-NEW MEXICO
PARTNERS
P O Box 96, Grants
(Gen Part: Homestake Mng Co
Limited Partners: United Western

Minerals Co; J H Whitney & Co;
White, Weld & Co; Rio de Oro
Uranium Mines Inc; San Jacinto
Petroleum Co; Clyde Osborn

SECTION 32 MINE, Ambrosia Lake, U₃O₈

Gen Mgr: Langan W Sweet
Geol: Theo Rizzi
Mech Eng: Roger Madsen
Met: Clyde Osborn
Mine Supt: Richard J Stoehr
750-TON CARBONATE LEACH PLANT,
6 mi NW of Grants
Supt: Clyde Garman
Asst Supt: Homer Derrer
Sampling Plant & Yard Frm: Wm V Story
Mill Frm: Robt W Strammler
Plant Met: Fred N Oberg
Ch Chem: John R Wesley
Control Eng: Harvey O Bird
Elec Frm: B W Brown
Mech Frm: Royce M Bricker
Shift Boss: Harry R Kroen, Alex
Carriere

HOMESTAKE-SAPIN PARTNERS (Gen Part: Homestake Mng Co, Limited)

Part: Sabre-Pinon Corp
Box 80, Grants
SECTION 16, 22 & 25 MINES, Ambrosia
Lake, undergr, U₃O₈
Gen Mgr: Langan W Sweet
Geol: Theo Rizzi
Mech Eng: Roger Madsen
Met: Eugene Allen
Mine Supt: Donald T Delicate
1,500-TON CARBONATE LEACH PLANT,
8 mi NW of Grants
Under constr

INTERNAT'L MINERALS & CHEM CORP, POTASH DIV

20 N Wacker Dr, Chicago 6, Ill
Pres: Louis Ware
Admin VP: T M Ware
VP, Potash Div: N C White
Sec: C M Edwards
Treas: R A Lenon
Gen Mgr: C A Arend, Jr
CARLSBAD POTASH MINE, Box 71,
Carlsbad, undergr, K₂CO₃ & K₂SO₄
Res Mgr: E C Skinner
Gen Supt: C E Pressnell
Geol: R Hougland
Mech Eng: L H Bummel
Met: W B Dancy
Elec Eng: J Ivy
Mine Supt: M W Kartchner
Mine Frm: W F Eckland
Mine Eng: Adolph Mitterer
Prod: 13,000 tons
13,000-TON FLOT MILL, at mine
Mill Frm: Dean Owen
Mill Supt: R M O'Flynn
(See Ariz, Colo, Fla, Ill, Me, Miss, NC,
Ohio, SD, Tenn, Va, Wyo)

KENNECOTT COPPER CORP CHINO MINES DIV

Hurley
Gen Mgr: W H Goodrich
Asst Gen Mgrs: E A Slover
J K Richardson
Dir Purch Agt: C H Dempsey
CHINO MINES, Santa Rita, open pit
& undergr, Cu, MoS
Mine Supt: G J Ballmer
Asst Supt: W E Herkenhoff
Mine Frm: K V N Harris
Mine Eng: H A Wilmet
Undergr oper: id
FLOT MILL, Hurley
Mill Supt: E A Schroer
Asst Mill Supt: F D Thayer
Mill Frm: B C Jacobs
REVERB SMELTER, Hurley
Supt: W H Winn
Asst Supt: W C Dow
(See Ariz, Nev, N Y, Utah)

KERMAC NUCLEAR FUELS CORP

(Owned by Kerr-McGee Oil Industries,
Inc; Pacific Uranium Mines Corp,
Los Angeles, Calif; Anderson Develop-
ment Co, Albuquerque, N Mex)
P O Box 218, Grants
MINES, Grants, undergr, U₃O₈
Under devel
MILL (Proposed)

KERR-McGEE OIL INDUS, INC., NAVAJO URANIUM DIV

P O Box 608, Shiprock
VP: A T F Seale
Mgr of Mng & Mfg: V L Mattson
Mine Supt: Jack London
COVE MINES, undergr, U₃O₈
Prod Frm: Vernon Williams
Mgr Mng & Mfg: M F Bolton
Mine Shift Bosses: Blaine Byers
W Edmondson

Mine Eng: Billy Stevens

Prod: 100 tons plus
MILL, Shiprock
Mill Supt: R E Shreve
Mill Frm: Floyd Jackson, Glenn
Nofsinger, Al Cynova,
Leo Carlton
(See Ariz, Colo, Ohio, Wyo, and
Kermac Nuclear Fuels, Colo, N Mex)

LARGO URANIUM CORP

SHIELD of FOUR CORNERS URANIUM
CORP, Denver, Colo
220 Mile High Center, Denver, Colo
Pres: E H Sanders
VP: Edw L Clark
Gen Supt: Wesley Smith
DIAMOND NO 1 MINE, 915 E Morgan,
Gallup, undergr, U₃O₈, V₂O₅
Geol: William D Tipton
Prod: 45 tons

LEACH & LEACH

P O Box U, Lordsburg
Gen Mgr: Francis I Leach
Geol: Albert & Leach
LADY FRANKLIN GROUP, Ag, Au, Mn
COLOSSAL-MIDNIGHT, Cu, As, Ag
RESERVATION-MINNEAPOLIS, As,
Ag, Pb
ALHAMBRA GROUP, U₃O₈, Ag, Ni, Co
ALASKA GROUP, GOLDEN LINK
GROUP, MALONE GROUP, As, Ag
Producing
FLOYD COLLINS GROUP, White Signal
dist, Grant County, U₃O₈

LISBON URANIUM CORP

304 First Security Bldg, Salt Lake
City, Utah
SAN MATEO HOME PROPERTIES,
Ambrosia Lake Area, U₃O₈
Devel Drilling Program under
direction of E J Longear Co
(See Mont, Colo, Utah, Wyo)

LONE STAR MNG & DEVEL CORP

225 Korber Bldg, Albuquerque
Pres: W L Davidson
Sec-Treas: W C Oestreich
LA BAJADA MINE, Santa Fe Canyon,
48 mi NE of Albuquerque, 12 mi SW
of Santa Fe, undergr, U₃O₈, Cu, Ni,
Co
Mine Supt: C A Bowerman
Prod: 40 tons
(See Utah)

LOST CANYON URANIUM & OIL CO

224 First Nat'l Bank Bldg, Albuquer-
que
LOUISE & KATHRYN MINES, undergr
Under devel

LUCK MNG & CONSTR CO

Box 26, Silver City
Own & Gen Mgr: G K Luck
BOSTON HILL MINE, Grant County,
surface, Mn

MAGDALENA MNG & MFG CO

1260 Simms St, Lakewood, Colo
MAGDALENA MINE, P O Box 236,
Magdalena, 17 mi S of Magdalena, Mn
Gen Mgr: R M Conrad
Under devel
(See Colo)

MATHIS & MATHIS

P O Box 482, Silver City
IRON HEAD CLAIM & PEARSON PIT,
near Pterro, Fe

McFARLAND & HULLINGER

Silver City
CONTINENTAL "B" MINE, Grant
County
Supt: R H Ashlock
(See Ariz, Colo, Utah)

MEX-TEX MNG CO, INC

Box 101, Socorro
Pres: J E Bishop
Gen Mgr: Ben B Scott
ROYAL FLUSH & SNAKE PIT MINES,
Socorro County, undergr, Ag, Pb,
BaSO₄, CaF₂
Mine Supt: Maynard Byrd
Prod: 150 tons
Under devel
500-TON GRAV MILL
Mill Supt: Frances Williams

MID-CONTINENT URANIUM CORP

P O Box 57, Grants
BARBARA J NO 1 MINE, 12 mi NW
of Grants, McKinley County, undergr,
U₃O₈
Gen Mgr: Harman E Ebblery
Gen Supt: Joseph F James

Geol: Coy M Mohley

Prod: 60 tons
DALCO NO 1 MINE, Grants, undergr,
U₃O₈
(Leased to Dalco Uranium, Inc, Grand
Junction, Colo)
(See Colo, Utah)

MINERALS ENGR CO, PETACA DIV

Box 428, Santa Fe
PETACA MINE, 64 mi N of Santa Fe,
open pit, mica
Gen Supt: R H Beck
Purch Agt: J S Walker
Prod: 250 tons
CAPITAN MINE, Rio Arriba County,
columbite, tantalum, monazite
MILL, at mine
Mill Supt: John DeVaney
Mill Frm: Leo J Trujillo
(See Colo, Mont)

MOLYBDENUM CORP OF AMERICA

Questa
Pres: Marx Hirsch
VP: E A Lucas
Treas: Wm B Kuntz
Gen Mgr: A L Oreslin
MOLY MINE, 7 mi E of Questa,
undergr, Mo
Supt: Jose Varela
Under devel
150-TON FLOT MILL
Supt: Robert Crel
Idle
(See Calif, Colo, NY, Pa)

NATIONAL POTASH CO

305 E 42nd St, New York 17, NY
Pres & Treas: R C Wells
VP & Gen Mgr: T G Ferguson
VP: W B Porterfield
Sec: H L Pierson
Purch Agt: J A Browell
MINE, Carlsbad, undergr, potash
Mine Supt: R W Jenkins
4,800-TON FLOT MILL, Carlsbad
Mill Supt: G L Jordan
(See NY)

NEW JERSEY ZINC CO, THE

160 Front St, New York, NY
VP, Mng & Explor: S S Goodwin
Sec: Walter R Anyon
EMPIRE ZINC DIV
Western Mng of Mines: F J Maloit
Gliman, Colo
HANOVER MINE, undergr, surface,
Zn, Pb, Hanover
Asst Supt: C C Snell
Idle
800-TON FLOT MILL
(See Colo, Ill, N J, NY, Pa, Tenn, Va,
Wisc)

OZARK-MAHONING CO, MNG DIV

310 West Sixth St, Tulsa 19, Okla
MINES, CaF₂
(See Colo, Ill, Okla)

PACIFIC URANIUM MINES INC

1934 White, Grand Junction, Colo
Pres: B Silbert
Sec-Treas: I Kibick
SECTION 24 & 26 MINES, Ambrosia
Lake dist, U₃O₈
Ch Geol: R L Redmond
Geol: J H Volgare, Jr
Prod: 1,000 tons
(Managed by Kermac Nuclear Corp,
Grants)
(See Calif)

PATTEN & GALASSINI

Box 296, Bayard
Part: L A Patten, Gene Galassini
BULLFROG MINE, Grant County, Pb,
Zn
CONTINENTAL "A" MINE, Grant
County

PERU MNG CO

Box 309, Silver City
Pres: Morris Blumberg
VP: J H Taylor
Sec: J S Flory, Jr
KEARNEY MINE, Ag, Pb, Zn
Gen Mgr: J W Faust
Mine Supt: W T Dow, L J Conley
PEWABIC MINE, Ag, Pb, Zn
PERU MILL, at mine
Mill Supt: S T McBee

PHELPS DODGE CORP

Tyrone
HURIO MT BRANCH
Agt: John F Black, Jr
Explor
COPPER & RACKET MINE, Grant
County, Co
(See Ariz, N Y, Tex)

PHILLIPS PETROLEUM CO

Grants
PHILLIPS #1 MINE, McKinley County,
U₃O₈
1,735-TON U₃O₈ MILL, Ambrosia Lake,
McKinley County
Supt of Mines: R W Jenkins
Gen Supt & Mill Supt: A A Rusko
Mng Eng: Roger Caywood
Geol: Richard Pascoe
Asst Supt of Admin: G E Karr
Dist Geol: George Brasher, Albuquer-
que; Dean Clark, Grants;
Fredrick Stugard, Gallup
(See Okla, Utah)

POTASH CO OF AMERICA

Box 31, Carlsbad
Pres: G F Cooke
VP & Treas: F O Davis
VP & Res Mgr: R G Hawthorth
Purch Agt: A H Beidel
Ind Rel Supt: R H Blackman, Jr
Gen Supt: H N Clark
Cont: W H Bartlett
MINE, 21 mi NE of Carlsbad,
undergr, potassium chloride
Plant Eng: R R Dabney
Safety Eng: R G Billings
Mine Supt: R R Knill
Mine Frm: Neil Juhola
Mine Eng: E C Jordan
Prod: 8,000 tons
4,000-TON FLOT MILL, at mine
Mill Supt: R E Smith
Asst Mill Supt: E M Dale, Jr

RARE METALS CORP OF AMER

1st Security Bldg, Salt Lake City 11,
Utah
Pres: C L Perkins
VP & Asst Gen Mgr: M H Kline
Sec-Treas: Virgil Rittmann
MINE, Ambrosia Lake dist, U₃O₈
Under devel
(See Ariz, Calif, Idaho, Utah)

REM URANIUM CO

702 S 3rd St, Gallup
Part: Arlode D Moore
"U" MINE, McKinley County, U₃O₈

REX URANIUM CORP

Box 1328, Farmington
Pres & Gen Mgr: R J Scanlon
VP: W B Colbert
Sec: John R Mendius
(See Calif)

RIO DE ORO URANIUM MINES INC

215 Fourth St, SW, Albuquerque
Pres: W Rodney DeVilliers
VP: G R Kennedy
Sec: R F Deacon Arledge
Treas: F A Fuller
Purch Agt: Ray Reynolds
DYSART NO 1 MINE, Ambrosia
Lake, undergr, U₃O₈
Gen Supt: Ray Schulte
Geol: Harold A Powers
Met: Clyde Osborn
Prod: 500 tons
RKE NO 1, Ambrosia Lake, undergr,
U₃O₈
Idle
MILL (See Homestake - N Mex
Partners)

SABRE-PINON CORP

103 Bokum Bldg, Santa Fe
Pres: Richard D Bokum, II
VP: W R Montgomery
Sec: George Slover, Jr
Treas: Hugh M Craigie
AMBROSIA LAKE MINE, Ambrosia
Lake, McKinley County, U₃O₈
(Under devel as Homestake-Sapin
Partners)
PROPERTIES, Ambrosia Lake dist,
& Mesa Gigante, Sandoval, &
Bernillo Counties
Explor
(See Colo)
CARBONATE LEACH PLANT
(Proposed)
(See Homestake-Sapin Part)

SAN CARLOS URANIUM CO INC

P O Box 697, Las Vegas
Pres: Charles Lujan
VP: Tony Gutierrez
Sec-Treas: Chas Lujan, Jr
WINDY NINE MINE, Sabino, San
Miguel County, open pit, U₃O₈, V₂O₅
Geol & Mine Supt: John Haberl
Prod: 30 tons
Under devel

ST ANTHONY URANIUM CORP

Box 1789, Grand Junction, Colo
Gen Mgr: A M Mastrovich
M-4 SHAFT, Valencia County, undergr,
U₃O₈
Gen Supt: Edward Matson
(See Colo, Kennecott Corp, NY)

SHIPROCK INDUSTRIES, INC

738 East Main, Farmington
 Pres: F T Anderson
 VP: Nels W Stahelm
 Sec-Treas: W G Clinchy
 MINE, Farmington, Sanatose dist,
 undergr, U₃O₈
 (See Colo)

SOUTHWEST POTASH CORP
(Subsidiary of AMERICAN METAL CLIMAX, INC)

61 Broadway, New York 6, N Y
 MINE, Box 472, Carlsbad, 22 mi
 NE of Carlsbad, undergr, potash
 Gen Mgr: Victor A Zandon
 Plant Eng: Dale L Schrader
 Purch Agt: A H Kunkel
 Mine Supt: John Sowers
 Mine Eng: Ira Herbert
 Prod: 4,000 tons
 4,000-TON FLOT MILL, at mine
 Mill Supt: J Frank Henderson
 Asst Mill Supt: George Harris
 Ch Chem: H S Kaplan
 (See American Metal Climax Co, Ltd,
 N Y)

STAR MINES

602 W 12th St, Silver City
 Pres & Gen Mgr: David D Omer
 MORNING STAR MINE, undergr,
 placer, Wyo, BI
 Mine Supt: Louis L Omer, Jr
 Prod: 10 tons
 24-TON GRAY MILL, at mine

THOMPSON, WARREN BARRY

P O Box 1837, Denver, Colo
 AJAX & LITTLE WAGON MINES,
 Colfax County, undergr, As, Wyo
 (See Colo, Utah)

U S BORAX & CHEMICAL

CORP, U S POTASH CO DIV
 Carlsbad
 Res Mgr: Earl H Miller
 Asst to Res Mgr: D L Libbey
 Purch Agt: R D Schenck
 MINE & REFINERY, 21 mi E of
 Carlsbad, potash
 Mine Supt: John S Wright
 Refinery Supt: George R Dowland
 (See Calif, N Y)

U S SMELTING REFINING &

MINING CO
 P O Box 698, Hayard
 MINE, Pb, Zn
 Supt: G E Cudney
 FLOT MILL
 Gen Mill Frn: Gordon T Glover
 (See Alaska, Ariz, Mass, Utah)

UNITED WESTERN MINERALS

136 W Palace Ave, Santa Fe
 Pres: Alva A Simpson, Jr
 Asst to Pres: E B White, Jr
 VP: Norman S Dike
 Sec-Counsel: Herbert A Holt
 Treas: Peter Cahill
 SEC 32, T-14N, R-9W, Ambrosia
 Lake, undergr, U₃O₈
 Geol: J W Patterson
 Prod: 400 tons daily (last quarter 1957)
 (This section owned by Homestake-
 New Mexico Partners)
 SEC 36, T-14N, R-10W, Ambrosia
 Lake, undergr, U₃O₈
 Op: Vanadium Corp of America
 Prod: 100 tons daily (last quarter 1957)
 (This section jointly owned by United
 Western Minerals: J H Whitney & Co;
 White Weld & Co; San Jacinto Petrol
 Corp)
 SEC 32, T-14N, R-10W, Ambrosia
 Lake, undergr, U₃O₈
 Ops: Kerr-McGee Oil Industries Inc,
 Kerr-McGee Nuclear Fuels
 Prod: 500 tons daily (first quarter 1958)
 (This section jointly owned by Kerr-McGee
 Oil Indust; United Western Minerals Co;
 J H Whitney & Co; White Weld & Co;
 San Jacinto Petroleum Corp)
 750 TON CARBONATE LEACH PLANT,
 near Grants (under const by Homestake-
 New Mexico Partners; completion date
 Feb 1958)
 Gen Supt: Clyde Osborn

UTCO URANIUM CORP

Suite 227, Guaranty bank bldg,
 Denver 2, Colo
 Pres: Geo S Casey
 VP & Gen Mgr: Mason W Rankin
 Sec: Harold Clark Thompson
 Treas: J D Vander Ploeg
 CHARLIE #2 (JETER) MINE, Box 253,
 Belen, undergr, U₃O₈
 Gen Supt: Donald W Wright
 Geol: Charles Evensen
 Mine Supt: Bill Wright
 Mine Frn: Keith Goodell

Prod: 40 tons
 (Leased from Capitol-Seaboard Co)
 HATTIE #2 MINE, Socorro County, N M

VANADIUM CORP OF AMER

420 Lexington Ave, New York, N Y
 VP: D W Viles
 Sec: D A Shriver
 Treas: L C Miller
 Purch Agt: F W Thomas
 SEC 36 MINES, McKinley County,
 U₃O₈, V₂O₅
 Mine Frn: Abe Day
 (See Ariz, Colo, N Y, Utah)

VERMILLION CLIFFS MNG
CORP

Box 1837, Flagstaff, Ariz
 Pres: C E Knowles
 VP: R E Darling
 Sec-Treas & VP of Oper: Allen C Tester
 SLATE, SILVER KING & RIO GRANDE
 MINES, Haysard Dist, N Mex, undergr,
 Pb, Zn
 Mine & Gen Supt: Ray Holmquist
 Mine Frn: Urbano Chacon
 (See Ariz)

VOGEL URANIUM MINE &
EXPLOR CO

Box 1183, Amarillo, Texas
 Gen Mgr: Harold W Vogel
 MIKIE V NO. 2, 6, 7 MINES, San
 Miguel County, open pit, Teolite
 Mag dist, U₃O₈, V₂O₅, Cu
 Asst Gen Mgr: Harold H Ham
 Under devel
 (See Colo)

WERNER LAKE NICKEL MINES

LTD
 311-300 Bay St, Toronto, Ont, Canada
 Pres: R C C Henson
 VP: G D Clarke
 Sec-Treas: G E Kennedy
 HENRY CLAY MINE, P O Box 545,
 Lordsburg, Cu, As, Ag
 Gen Mgr: Murray Watts
 Geol: A Mahalek
 Under devel

WESTVACO MINERAL

PRODUCTS DIV
 (FOOD MACHINERY & CHEM CORP)
 Star Route Box 24, Grants
 FAITH MINE, Grants, Ambrosia Lake
 Dist
 Geol: R J Hayden
 Mine Supt: R C Kirchman
 Asst Mine Supt: Jack W Spencer
 Under devel

WESTWATER CORP

103 Bohum Bldg, Santa Fe
 Pres: J E Brosseau
 VP: C C Green, Jr
 Sec: W L Leeds
 Treas: Peter Ortiz V Pine
 WESTWATER #1 MINE, Sec 2 T 13N
 R 16W, McKinley County
 Mine Supt: James H Mallory
 Under devel

ZUNIGA MINES, INC

Box 808, Silver City
 Pres: Douglas B White
 VP: Earl Strong
 Sec-Treas: Frank Light
 ZUNIGA MINE, near Fierro, Grant
 County, surface, Cu
 Prod: 100 tons
 LEACHING MILL, at mine

NEW YORK**ALLIED CHEM & DYE CORP,**
GEN CHEM DIV

48 Sector St, New York 6
 VP: I H Fooheee
 Mgr: R H Dickson
 Asst Mgr, Mng Oper: W J Trepp
 Dir, Purchases: F J French

AMER AGRI CHEM CO, THE

50 Church St, New York 7
 Pres: C M Powell
 VP: B R Richay
 Sec & Treas: Hughes Mayo
 Purch Agt: G E Campbell
 (See Fla)

AMERICAN CYANAMID CO

30 Rockefeller Plaza, New York
 Pres: K C Towe
 VP: R B Fluke, Ed Powers, W G
 Malcolm, R C Swain, G R Martin,

S C Moody, L C Parkinson
 Treas: G C Walker
 Sec: R S Kyle
 (See Ark, Fla, Ga, Va)

AMERICAN METAL CLIMAX,
INC

61 Broadway, New York 6
 Chmn of Bd: Arthur H Bunker
 Pres: Hans A Vogelstein
 VP: T W Childs, H S Cohen, Frank
 Goolbaugh, H de Neufville,
 A J Hertz, G V Land, Ian K
 MacGregor, J Payne, Jr, E T
 Rose, W G Thomas, Jean
 Vuillequies, R E Warriner
 Sec: Edwin A Weil
 Treas: Donald J Donahue
 (See Pa, Climax Molybdenum Div,
 Colo, Pa; U S Metals Ref Co in Mich,
 N J & Southwest Potash Corp in N Mex,
 & N Y)

AMERICAN MACH & METALS,
TROUT MNG DIV

233 Broadway, New York 7
 Chmn of Bd: John C Vander Pyl
 Pres: Charles W Anderson
 VP: I Newton Decher, John S
 Swenson, Ambrose E LeVan
 Comptroller: Glenn A Swenson
 Sec: Alphonse Kenison
 Asst Sec: Roy F Stachel, Henry C Doode
 Treas: Robert G Burns
 Asst Treas: Harry C Anderson, Albert
 L Ewing
 Asst Sec & Treas: Patricia A
 Harrington, William H Behrens
 Purch Agt: Roy McLeod
 (See Mont)

AMERICAN SMLTG & REFIN
CO

120 Broadway, New York
 Chmn of Bd: Kenneth C Brownell
 Pres: R W Vaughan
 Chmn of Fin Com: O S Strauss
 VP: R D Bradford, A A Brown, F H
 Eichler, J D MacKenzie, A J
 Phillips, S D Strauss, F Walker
 Treas: F G Hamrick
 Sec: Harold Howe
 Mgr, Ore Purch Dept: R L Jourdan
 MINING DEPT
 Asst to VP: D J Pope
 Res Eng: V I Mann, C E Nelson
 Expl Mgr: C P Pollock
 Ch Geol: L H Hart
 PURCHASING DEPT
 Dir: F H Eichler
 TRAFFIC DEPT
 Gen Tr Mgr: F L Morwin
 (See Ariz, Calif, Colo, Idaho, Ill,
 Kans, Md, Mont, Neb, N J, N Mex,
 Tex, Utah, Wash & Federal Mng &
 Smelting Co, Mo)

ANACONDA ALUMINUM CO

25 Broadway, New York
 Pres: R B Caples
 VP: C H Steele
 Sec-Treas: C E Moran
 Purch Agt: A D Harris
 (See Montana)

ANACONDA CO, THE

25 Broadway, New York
 Chmn of Bd: Roy H Glover
 Pres: Clyde E Weed
 Exec VP: Edward S McGlone
 VP, Mng Oper: Richard S Newlin
 VP, Met Oper: Russel B Caples
 VP, Western Oper: Chester H Steele
 VP & Comptroller: W Kenneth Daly
 VP Latin-American Affairs:
 Thomas A Campbell
 Sec & Treas: C Earle Moran
 Asst Sec: Jeremiah D Murphy
 Asst Sec & Asst Treas: David R Nelson,
 Ralph E Schneider, Edw Mayo,
 Joe J Cinaglia
 Asst Comptroller: William E Quigley
 VP & Ch Geol: V D Perry
 Gen Counsel: C Jay Parkinson
 (See Calif, Idaho, Mont, Nev, N Mex,
 Utah)

BARTON MINES CORP

N Creek, Warren County
 Pres: H H Barton
 VP & Mgr: H H Vogel
 Sec & Prod Mgr: C R Barton, Jr
 Gen Frn: Howard Waldron
 Purch Mgr: T Leonard, Jr
 Cont: J B Burns
 Met: William Kitting
 MINE, near North Creek, open pit,
 garnet
 Mine Frn: G Brown
 Prod: 400 tons
 400-TON GRAY-FLOT-HEAV-MED
 MILL, at mine

BEAR CREEK MNG CO

161 42nd St, New York 17
 (See Utah, Wash, & Kennecott Copper
 Corp, N Y)

BUTTE COPPER & ZINC CO

25 Grand St, New York 4
 Pres: A A Shalare
 VP & Treas: Miles MacDonald
 Sec: John F Cole
 (See Mont)

CALLAHAN ZINC-LEAD CO

100 Park Ave, New York 17
 Pres: J T Hall
 VP: R F Mahoney, P D Wilson
 Sec-Treas: E A Salo
 (Property transferred to Pinnacle Expl,
 Inc, Colo)

CALUMET & HECLA, INC

60 E 42nd St, New York
 Pres: E R Lovell
 Exec VP: H Y Bassett
 VP & Gen Mgr: A S Kromer
 (See Ill, Mich, N Mex)

CAMP BIRD LTD

70 Pine St, New York 5
 Chmn: John Dalgleish
 Cons Eng: C Maxwell Norman
 Sec: Ian Whyte
 (See Colo)

CLIMAX URANIUM CO
Subsidiary of AMERICAN METAL CLIMAX

INC
 500 Fifth Ave, New York 36
 Sec: L A Cowan
 Treas: W Macgregor
 (See Ariz, Colo, Utah)

CLINTON MET PAINT CO

Clinton
 Pres & Treas: Bruce M Bare
 Sec & Purch Agt: Mrs C K Covel
 MINE NO 3, Clinton, undergr, iron
 oxide
 Gen Supt: Robert Barry
 40-TON MILL, Franklin Spr
 Mill Supt: Ray Chrysler

CONSOL COPPERMINES CORP

405 Lexington Ave, New York 17
 Pres: Chester D Tripp
 VP: Claude F Leonard
 VP & Treas: Charles L Steeger
 Sec: E J A Tenbrink
 (See Nev)

COPPER CITIES DIV

MIAMI COPPER CO
 61 Broadway, New York
 Pres: E H Westlake
 VP: J N Ffolliott
 VP & Treas: J H Greenburgh
 Sec: Henry Kaufman
 Purch Agt: R L Beale
 (See Ariz & Miami Copper Co, Ariz
 & N Y)

CYPRUS MINES CORP

485 Lexington Ave, New York
 Pres: H T Mudd
 VP: A R Thomas
 VP & Treas: H S Nye
 Sec: L A Garrett
 Purch Agt: W F Stover
 (See Ariz, Calif, Colo)

FREEMONT SULPHUR CO

161 E 42nd St, New York 17
 Pres: Longbourne M Williams
 Chmn Exec Comm: C A Wright
 Exec VP: R C Hills, H L Pierson
 (See La, N Mex & Nat'l Potash Co, NY)

GOLDFIELD AMERICAN

DEVELOPMENT, LTD
 123 Williams St, New York 38

GOVERNOR TALK CO, INC

c/o R T Vanderbilt Co, 230 Park
 Ave, New York 17
 Pres: F B Vanderbilt
 Sec: H B Vanderbilt
 Treas: F C Gens
 Purch Agt: K J Miles
 VANDERBILT MINE, Balmat, undergr,
 lvs
 VP & Gen Mgr: R S McClellan
 Mine Supt: J Bulgar
 Frn: Leon Typhair
 Mine Eng: Geo Erdman
 Prod: 350 tons
 300-TON DRY GRIND PLANT
 Mill Supt: Howard Adam

GREAT LAKES CARBON CORP

18 E 48th St, New York
 Pres: George Shabel, Jr
 VP & Gen Mgr: D L Marlett
 Oper Mgr: E A Harris
 Asst Oper Mgr: N V Brower
 Purch Agt: Jay Hughes
 (See Calif, Colo, Nev, N Mex, Oreg)

HAILE MINES, INC

500 Fifth Ave, New York 36
 Pres: W M Weaver, Jr
 Chmn of Bd: W Lunsford Long
 VP: Hewitt S West, Jr, Frederick McGonigle
 VP & Sec: Charles R Skinner
 Treas: Joseph F Willmott
 (See N Mex)

HOLLY MINERALS CORP

Chrysler Bldg, New York 17
 Pres: A H McKee
 VP: J G Heaton
 (See N Mex, Idaho)

IDAHO ALTA MINERALS CORP

270 Madison Ave, New York 18
 (See Idaho)

INSPIRATION CONSOL COPPER CO

25 Broadway, New York 4
 Pres: R S Newlin
 VP & Gen Mgr: P D Honeyman
 VP & Sec: H M Jacob
 Treas & Asst Sec: E F Wendt
 Purch Agt: A B Harris
 (See Ariz)

INTERNAT'L SALT CO, INC

Retain
 RETSOF MINE, 4 mi S of Genesee
 undergr, rock salt
 Gen Mgr: T F Courthope
 Purch Agt: J A Cooney
 Pl Mgr: S Martin
 Pl Eng: R Coates
 Elec Eng: D L Moyness
 Prod Supt: J J Riordan
 Mine Supt: Lawrence Teter
 Asst Mine Supt: Lewis Bush
 Mine Eng: Chester Truax, Jr
 Prod: 4,000 tons
 (See Pa)

INTERNAT'L TALC CO, INC

Box 286, Gouverneur
 Gen Mgr: Frederick Kuehl
 MINE, talc
 Supt of Mines: David J Crawford

JOHNS-MANVILLE SALES CORP

22 E 40th St, New York 18
 Chmn Bd: L M Cassidy
 Pres: A R Fisher
 VP: K W Huffine
 Sec: H M Ball
 Treas: R Hackney
 Purch Agt: D H Lyons
 (See Johns-Manville Products Corp, Calif)

JONES & LAUGHLIN STEEL CORP, NEW YORK ORE DIV

Star Lake
 BENSON MINES, 32 mi E of Gouverneur, open pit, Fe
 Mgr: R G Fleck
 Asst Mgr: A F Peterson, Jr & M O Peterson
 Ch Mng Eng: E M Smoby
 Pl Met: E A Eastman
 Res Eng: Carl Djewich
 Ch Asst: A R Eshbach
 Geol: F J West
 Ind Eng: F E Woodworth, Jr
 Gen Frm, Pit: W P Bach
 Gen Frm, Conc: W A Vickers
 Gen Frm, Sinter: R W West
 Gen Frm, Maint: P L VerSteeg
 Ch Elec: R F Peterson
 Safety Supt: C LaDuke
 (Prod: 18,000 tons crude
 9,000 tons concentrate)
 GRAY & MAGNETIC SEPARATOR MILL, at mine
 SINTER PLANT, at mine
 (See Mich, Minn, Pa)

KENNECOTT COPPER CORP

161 E 42nd St, New York 17
 Pres: C R Cox
 VP, Explor: James Boyd (Bear Creek Mng Co)
 VP, Research: Leslie G Jenness
 VP: Frank R Milliken
 Sec: Paul B Jessup
 Treas: E S Henn
 Compt: G B Russell
 Dir, Eng: F W Chambers
 Dir, Ind & Pub Rgt: A S Cherouney
 Counsel: S S Jackson
 Gen Purch Agt: L W Shelton
 Gen Traffic Mgr: R E Taylor,
 (See Ariz, Nev, N Mex, Utah and subsidiaries, Bear Creek Mng Co, NV, Utah, Wash; St Anthony Uranium Corp, Colo, N Mex)

MANGANESE, INC

500 Fifth Ave, New York 36
 Pres: W M Weaver, Jr
 Chmn of Bd: W Lunsford Long
 Exec VP: Hewitt S West, Jr
 VP, Charge of Oper: F A McGonigle
 Sec: Charles R Skinner
 Treas: J F Willmott
 (See Nev)

MERCURY & CHEMICALS CORP

342 Madison Ave, New York 17
 Chmn of Bd: Bernard J Chubel
 Pres: Richard P Fischer
 VP & Sec: Haring Chander
 Treas: George Ornstein

METAL & THERMIT CORP

100 Park Ave, New York
 (See Va)

MIAMI COPPER CO (COPPER CITIES DIV)

61 Broadway, New York 6
 Pres: E H Westlake
 Treas: John O Greenburgh
 VP: J H Ffolliott
 Sec: Henry Kaufman
 (See Ariz & Copper Cities Div, Ariz & NY)

MOLYBDENUM CORP OF AMERICA

375 Park Ave, New York 23
 Pres: Mark Hirsch
 Exec VP: Emil A Lucas
 Sec: James S Crawford
 Treas: William A Kuntz
 (See Calif, Colo, N Mex, Pa)

NAT'L LEAD CO

111 Broadway, New York 6
 Pres: Joseph A Martino
 VP: Alfred H Drewes, Frank J Koegler, David A Merson,
 Joseph H Reid, William J Welch,
 Harry C Wildner
 Sec: John D Henrich
 Treas: Joseph J Moreman, Jr
 Comptroller: George A Dewey
 TITANIUM DIV MINE, Tahawus,
 Essex County, Ilmenite, magnetite
 (See Ark, Calif, Colo, Kans, La, Mo,
 Mont, Tenn, Tex, Utah, Wyo)

NAT'L POTASH CO, SUBSID OF FREEPORT SULPHUR CO & PITTSBURGH CONSOL COAL CO

305 E 42nd St, New York 17
 Pres: R C Wells
 VP: T G Ferguson & W B Porterfield
 Sec: H L Pierson
 (See N Mex)

NEW JERSEY ZINC CO, THE

160 Front St, New York 38
 Pres: R L McCann
 VP, Mng & Explor: S S Goodwin
 Treas: Samuel Riker, Jr
 Purch Agt: W C Dunlap
 (See Colo, Ill, N J, N Mex, Pa, Tenn,
 Va, Wis)

NEW YORK & HONDURAS ROSARIO MNG CO

Rm 1855, 120 Broadway, New York 5
 (See subsid Rosario Explor Co, Colo & NY)

NEWMONT MNG CORP

300 Park Ave, New York 23
 Pres: P Malozemoff
 VP: M D Banghart, R C Bonebrake
 Sec: Carroll Searls
 Treas: W T Smith
 Purch Agt: H W Volkman
 Control: W P Schmid
 (Wholly owns Resurrection Mng Co,
 Colo; has operating interest in Idarado
 Mng Co, Colo; controls Dawn Mng Co,
 Wash)

NORBUTE CORP

406 Park Ave, New York 22
 Pres: Nicolas M Salgo
 1st VP: Howard S Plant
 VP: Morton S Muller
 Compt: Sheldon E Perlman
 Sec: Seymour Fiance
 Treas: Wm H Rose
 (See Utah)

NORTHERN MINERALS, INC

Keeville
 Pres: K D Burnham

PACIFIC TIN CONSOL CORP

120 Broadway, New York
 (See subsidiary, Feldspar Corp, Ga,
 NC, Tenn)

PANAMINAS, INC

230 Park Ave, New York
 VP: J M Robison

PHELPS DODGE CORP

300 Park Ave, New York 22
 Chmn of Bd: L S Cates
 Pres: R G Page
 VP: C E Dodge, G R Drysdale,
 J M Hawkins, C R Kuzell
 Asst VP & Sec: J E Maesten
 Mgr of Explor: H Z Stuart
 Compt: J M Hawkins
 Asst Compt: K A Lawrence, A P
 Pierson
 Treas & Asst Sec: M W Urquhart
 Asst Sec-Treas: R D Barnhart
 Asst Sec-Treas: H R Dobbs
 Gen Purch Agt: P G Lee
 Gen Traffic Mgr: J W Lee
 Asst Gen Traffic Mgr: B Fonseca,
 H Wright
 (See Ariz, N Mex, & Phelps Dodge
 Ref Corp, NY & Tex)

PHELPS DODGE REF CORP, SUBSID OF PHELPS DODGE CORP

300 Park Ave, New York 22
 Chmn of Bd: Walter C Bennett
 Pres: C S Harloff
 VP: Howard Barkell, C H Winslow, Jr,
 C E Dodge
 Sec: J B Beatty
 Treas: M W Urquhart
 Purch Agt: P G Lee
 Asst Treas: H R Dobbs, R D Barnhart
 Compt: J M Hawkins
 LAUREL HILL REF & SMLTR,
 Laurel Hill, Cu, S, Ni, Selenium,
 Tellurium
 Pl Mgr: F W Richardson
 (See Tex, Phelps Dodge Corp, Ariz,
 N Mex)

PINNACLE EXPLORATION INC

100 Park Ave, New York
 Pres: Philip D Wilson
 VP: J T Hall
 (See Calif)

PITTSBURGH CONSOL COAL CO

(See Nat'l Potash Co)

RAMAPO URANIUM CORP

Warwick
 Pres: Sidney Lieberman
 MINE
 Under devel

REPUBLIC STEEL CORP

Republic Bldg, Cleveland Ohio
 OLD BED, HARMONY & FISHER
 HILL MINES, Mineville, undergr, Fe
 Mgr: F J Myers
 Supt: J R Brennan, Sr, J R Murphy
 Eng: W A Blomstrom
 Maint Supt: J R Brennan, Jr
 Ch Eng: A K McClellan, Jr
 Prod: 3,000,000 tons per year
 CHATEAUGAY MINE, Lyon Mt,
 undergr & surface, Fe
 Mgr: W G Crusberg
 Supt: Jos Tolosky, Sr
 Ch Eng: P J McMenamin
 Maint Supt: Howard Pigg
 Elec: Peter Daniels
 Prod: 1,250,000 tons per year
 CHATEAUGAY MILL, magnetic
 Supt: J R Tolosky, Jr
 Ch Chem: J M Scott
 Prod: 385,000 tons conc per year
 (See Ala, Mich, Minn, Ohio)

RESURRECTION MNG CO

Subsid of NEWMONT MNG CORP
 300 Park Ave, New York 22
 Pres: Fred Searls, Jr
 Sec: John E D Grunow
 Treas: W P Schmid
 (See Colo & Newmont Mng Corp, NY)

REYNOLDS MINERALS CORP

27 William St, New York
 Pres: Douglas J Lockhurst
 VP: G C Ridland
 Sec: Joseph Masopust
 Treas: Robert J Siro
 (See Colo)

RUBBEROID CO

500 Fifth Ave, New York
 MINE, Wheatland Center
 (See Vt)

RUTILE MNG CO OF FLA

111 Broadway, New York
 Pres: Charles C Norris, Jr
 VP: John Ross
 Sec: A J Drexel Paul, Jr
 Treas: Peter E Connell
 (See Fla)

ST JOSEPH LEAD CO

350 Park Ave, New York 17
 Pres: Andrew Fletcher
 VP: C Merrill Chapin, Jr, Francis
 Cameron, Chas R Ince, R J
 Mehin
 VP & Treas: G I Bridgen
 Asst VP: Robert H Ramsey
 Asst Treas: E P Merrill
 Cont & Asst Treas: James G Colvin
 Sec: D K Lourie
 Asst Sec: W J Elliot
 EDWARDS & BALMAT MINES,
 Balmat, St Lawrence County,
 undergr, Zn, PbS, FeS
 Mgr: Marshall G Jones
 (See Mo, Pa)

SHATTUCK DENN MNG CORP

120 Broadway, New York 5
 Pres: Thomas Bardou
 VP: S S Shattuck
 Asst VP: R J Higgins, T W Newell,
 D M Kentro
 Sec: John A Moss
 Treas: Thomas V Tosti
 (See Ariz, Colo)

SOUTHWEST POTASH CORP

(Subsid of THE AMERICAN METAL
 CLIMAX, INC)
 161 Broadway, New York 6
 Pres: T W Childs
 VP: John Payne, Jr, T G Moore,
 Thomas E Camp, Jr, F H
 Stewart, Jean Vuillequez
 Sec: E A Well
 Treas: Hans A Vogelstein
 Cont: Herbert S Cohen
 (See N Mex)

TEXAS GULF SULPHUR

75 E 45th St, New York
 Chmn of Bd: F M Nelson
 Pres: C O Stephens
 VP: E C Meagher, E F Vanderstucken,
 Jr, C F Fogarty
 Purch Agt: R L Carter
 (See Tex)

TRI-STATE ZINC, INC

123 Williams St, New York 38
 Pres: R F Playter
 VP: V C Allen
 Sec-Treas: J H Nicholls
 (See Ill, Va)

TUNGSTEN MNG CO

TUNGSTEN MNG CORP
 500 Fifth Ave, New York 36
 Chmn of Bd: L W Long
 Pres: Wm M Weaver, Jr
 VP: F A McGonigle, H S West, Jr
 Sec: C R Skinner
 Treas: J F Willmott
 (See N C)

UNION CARBIDE NUCLEAR CO, DIV OF UNION CARBIDE CORP

30 E 42nd St, New York 17
 Pres: Lyman A Bliss
 VP: Clark E Center, L M Currie,
 S J Cromer, Oscar F Holmgren,
 A Q Lundquist, W M Smart
 (See Calif, Colo, Utah)

US BORAX & CHEM CORP

US POTASH CO DIV
 30 Rockefeller Plaza, New York
 Pres: J M Gersley
 VP & Gen Mgr: F J O'Brien
 Sec: W A Ackerman
 Treas: R C Dosta
 Purch Agt: J C Walker
 Asst Gen Mgr: R F Steel
 VP & Gen Mgr Pacific Coast Borax
 Co Div: J F Corkill
 VP & Gen Mgr US Potash Co Div:
 Dean R Gidsey
 VP 20 Mule Team Frode Div:
 D V Parker
 VP of Foreign Opr: N C Pearson
 VP: Paul Speer
 Asst Treas: J H Hadfield
 Asst Sec: Gertrude B Stiehler
 (See Calif, N Mex)

VANADIUM CORP OF AMER

420 Lexington Ave, New York 17
 Pres: W C Keeley
 VP, Mng: D W Viles
 Sec: D A Shriver
 Purch Agt: F W Thomas
 Treas: L C Miller
 (See Ariz, Colo, N Mex, Utah)

VULCAN SILVER LEAD CORP

100 Park Ave, New York 17
 Pres: J T Hall
 VP: R F Mahoney, H J Hull
 Sec-Treas: E A Salo
 (Property transf'd to Pinnacle Expl
 Co, Inc)

WAM CHANG CORP
233 Broadway, New York
Chmn of Bd: K C Li
Eng: T K Li
Gen Mgr: J J Struvel, Jr
Asst Gen Mgr: George Reid
TUNGSTEN REFINERY, Glen Cove
(See Calif, Nev, Tex, & E A Scholz & J H Casler, Ariz)

NORTH CAROLINA

APPALACHIAN SULPHIDES INC

6th Flr, 360 Bay St, Toronto, Ontario, Canada
Pres: J Cunningham-Dunlop
VP: W H Woods
Treas: H E Nause
Sec: Philip Bastedo (New York City)
ORE KNOB MINE, Jefferson, undergr, Cu, Au, Ag
Gen Mgr: J F Cowley
Mine Mgr: Philip Eckman
Prod: 350 tons
700-TON MILL, at mine
(See Va)

CAROLINA PYROPHYLLITE CO

1104 E Wendover Ave, Greensboro
VP: John E Boyd
MINE & MILL, Staleya
MINE & MILL, Glendon

CHESAPEAKE & COLORADO CORP

909 16th St, N W, Washington 6, DC
MOUNT CELO & BAILEY MINES, Spruce Pine, feldspar, mica
Gen Supt: Tom Campbell
Prod: 2,000-2,500 lbs book mica weekly
(See Colo)

FELDSPAR CORP, THE

Box 335, Spruce Pine
Pres: N Cleveland
VP: F S Miller, C P Rogers, Jr
Sec-Treas: Glenn N Blevins
MINE, Spruce Pine, surface, feldspar
Gen Mgr: Carroll Rogers, Jr
Asst Gen Mgr: P C Coletta
Supt: Ralph Hughes
Met: L L McMurray
Frm: Robert Boone
FLOT MILLS, Spruce Pine
Supt: Ralph W Hughes, Spruce Pine
Asst Supt: Carl Burleson, Spruce Pine
Total Capacity: 1,000 tons per day
(Subsid of Pacific Tin Consol Corp, NY)
(See Ga, Tenn)

FOOTE MINERAL CO

18 W Chelton Ave, Phila 44, Pa
Pres: L G Hiles
VP: F B Shay
Sec: W Spofford
Treas: J S Gates
Purch Agt: W M Raynor
KINGS MT DIV MINE, Kings Mt, open pit, Spodumene
Mine Frm: L L Day
Mine Supt: R C Flow
Mine Eng: M Huston
Plant Eng: W A Eldon
Plant Acct: D R Smith
Gen Mgr: N O Johnson
Asst Gen Mgr & Gen Supt: E R Goter
Geol: T L Kessler
HEAVY MEDIA FLOT MILL, at mine
Mill Supt: T J Albrecht
Mill Frm: T Gordon
Assayer: M Carpenter
(See Pa, N H, Tenn, Va)

INTERNAT'L MINERALS & CHEMICAL CORP

20 N Wacker Dr, Chicago 6, Ill
MINE, Kona, open pit, feldspar, mica
Gen Supt: L W Breeman, Jr
Asst Gen Supt: Robah Thomas
Mine Supt: C Buchanan
Gen Frm: Clyde Brinkley
Prod: 1,000 tons
MINE, Spruce Pine, open pit, feldspar, mica
Gen Supt: Charles Hickey
Asst Gen Supt: Claude Thomas
Mine Supt: C Stamey
Prod: 700 tons
FLOT PLANTS, at mines
(See Ariz, Colo, Ill, Fla, Me, Miss, N Mex, Ohio, S D, Tenn, Va, Wyo)

KINGS MT MICA CO, INC

Box 709, Kings Mt
Pres: James B Preston, Jr
Sec: Hamilton Douglas, Sr
Treas: Roy H Gunter
Gen Mgr: Paul A Lancaster
PATTERSON MINE, 2 mi NW of Kings Mt, surface, mica
Prod: 400 tons
400-TON MILL, at mine
Mill Supt: James E White
MOSH MINE, 4 mi SW of Kings Mt, surface, mica
400-TON MILL, at mine
Mill Supt: Marvin Lancaster

LAWSON UNITED FELDSPAR & MINERAL CO

Spruce Pine
Pres: R W Lawson
VP: Robert Lawson, Branch Lawson
Sec-Treas: C D Lawson
MINE, Minpro, open pit, Feldspar, Mica
Gen Mgr: Thomas L Lawson

LITHIUM CORP OF AMERICA INC

Bessemer City
BESSEMER CITY MINE, open pit, Lithium compounds from spodumene
Mines Mgr: J N McClure
CHEMICAL PLANT, Bessemer City
Plant Mgr: R N Nielsen
(See Minn)

PACIFIC TIN CONSOL CORP

(See NY, The Feldspar Corp)

SOUTHERN MICA CO

Johnson City, Tenn
SULLINE MINE, Spruce Pine, open pit, mica
Gen Mgr: C Bailey Rice
Gen Supt: George W Edge
Mine Frm: Cecil Renfro
(See Tenn)

STANDARD MINERAL CO

Rubidine
Pres: F B Vanderbilt
VP: H B Vanderbilt
Sec: Fred Chappell
Treas: F C Gens
Purch Agt: W J Woodward
MINE, undergr, open pit, pyrophyllite
Gen Mgr: Fred Chappell
Asst Gen Mgr: Roy Harris
Eng: Paul Ward
Mine Frm: Cecil Horner
FINE GRINDING MILL, at mine
Mill Frm: H L McLaurin
Capacity: 75,000 tons annually

TUNGSTEN MNG CORP

P O Box 931, Henderson
VP & Gen Mgr: James R Sweet
Gen Supt: W R Atkins
Purch Agt: G V Boyd
Ch Eng: A M Szynkiewski
Master Mech: W F Edwards
HAMME MINE, Tungsten, undergr, WO₃ concentrates, hubnerite, synthetic scheelite
Mine Supt: E H Roberts
Asst Mine Supt: J W Aker
Mine Eng: Phipps A Hager
Prod: 1,100 tons
830-TON FLOT-GRAV MILL, Tungsten, Syn Scheelite Pl Supt: Carl F Gommel
Asst Pl Supt: J V Hamme
Mill Frm: R Lee Angel
Assay: S B Adams
(See N Y)

OHIO

AMERICAN ZINC OXIDE CO

(Subsidi of AMERICAN ZINC, LEAD & SMELT CO)

1515 Paul Brown Bldg, St Louis 1, Mo
REFINERY, Columbus
VP & Gen Mgr: A C Eide
Gen Supt: W T Malden
Purch Agt: C M Chambers
(See Ariz, Ill, Mo, Okla, Tenn, Tex, Wash, Wis)

BASIC INCORPORATED

645 Hanna Bldg, Cleveland 15
Pres: H P Ealla, Jr
Purch Agt: G H Rutherford
MAPLE GROVE QUARRY & PLANT, (Mail: Fostoria), Maple Grove, Seneca County, surface, dolomite
Works Mgr: A M Calto
(See Nev)

BUTLER BROS

1300 Leader Bldg, Cleveland 14
Chmn of Bd: Patrick Butler
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Minn)

CLEVELAND-CLIFFS IRON CO, THE

1460 Union Commerce Bldg, Cleveland 14
Chmn of Bd: A C Brown
Pres: W A Sterling
Asst to Pres: Grover J Holt
VP: D R Forrest
VP, Mng: C W Allen
VP, Finance: H S Harrison
VP, Law: J H Kerr
VP, Sales: J S Wilbur
VP, Marine Dept: H L Gobette
Asst VP, Mng: Fayette Brown, Jr
(See Mich, Minn)

CONSUMERS ORE CO

1300 Leader Bldg, Cleveland 14
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish & J C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner

CONTINENTAL MINERAL PROCESSING CORP

1st Nat'l Bank Bldg, Cincinnati 2
VP & Gen Mgr: Frederick A Hauck
VP: Albert E Grogan, G D Slaughter
Sec: Vincent H Beckman
(See Fla)

DOUGLAS MINING CO

1300 Leader Bldg, Cleveland 14
(M A Hanna Co, Agts)
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Sec-Asst Treas: S L Engel
Asst Sec: F W Bennett
Treas: R H Bartholomew
(See Minn)

EAGLE-PICHER CO, THE

INSUL DIVISION
American Bldg, Cincinnati
Pres: T Spencer Shore
VP & Treas: Carl A Geist
VP & Comptroller: Wm R Dice
VP & Gen Mgr, Mng & Smelt Div: O A Rockwell
VP & Gen Mgr, Chem Div: Miles M Zoller
VP & Gen Mgr, Fabric Div: Louis A Fisher
Sec: Richard Serviss
(See Ill, Kans, Nev, Okla, Wis)

M A HANNA CO, THE

1300 Leader Bldg, Cleveland 14
Agent for the following companies:
Butler Bros, Consumers Ore Co, Douglas Mining Co, Hanna Coal & Ore Corp, Hanna Iron Ore Div (Nat'l Steel Co), Hanna Ore Mining Co, Morton Ore Co, Oark Ore Co, Philbin Mining Co, Richmond Iron Co, South Agnew Mining Co
(See Oreg)

HANNA COAL & ORE CORP

1300 Leader Bldg, Cleveland 14
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: J W Buford, J K Gustafson
Sec: L W Spang
Treas: W C Pieper
Asst Treas: R E Beal, R H Bartholomew
Asst Sec: L E McChesney, W C Pieper, S L Engel
(See Mich, Minn)

HANNA IRON ORE DIV NAT'L STEEL CORP

1300 Leader Bldg, Cleveland 12
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Asst Secs: S L Engel, F W Bennett
Treas: R H Bartholomew
Asst Treas: S L Engel
(See Mich, Minn)

HANNA ORE MINING CO

1300 Leader Bldg, Cleveland 14
Chmn of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger, R W Whitely
Sec-Asst Treas: S L Engel
Asst Sec: F W Bennett
Treas: R H Bartholomew
(See Minn)

MONTREAL MNG CO

(See Oglebay Norton & Co, Ohio, and Montreal Mng Co, Wis)

OGLEBAY NORTON & CO, AGENTS, MONTREAL MNG CO

Hanna Bldg, P O Box 6506, Cleveland 1
Pres: Harrie S Taylor
VP: Courtney Burton, Fred R White
VP & Treas: E W Sloan, Jr
Sec & Gen Counsel: John J Dwyer
(See Oglebay Norton & Co, Minn, & Montreal Mng Co, Wis)

OZARK ORE CO, (SUBSID OF HANNA COAL & ORE CORP)

1300 Leader Bldg, Cleveland 14
Pres: G W Humphrey
VP: R C Fish, R C Rieger
Sec & Asst Treas: S L Engel
Treas: R H Bartholomew
(See Hanna Coal & Ore Corp, Mich, Minn, Mo, Ohio, & Ozark Ore Co, Mo)

PICKANDS MATHER & CO

2000 Union Commerce Bldg, Cleveland 1
Managing operators for BALKAN MNG CO, BENNETT MNG CO, BIWABIK MNG CO, CAMPBELL MNG CO, CORICA IRON CO, CRETE MNG CO, CUYUNA ORE CO, ERIE MNG CO, HOYT MNG CO, IRON RANGE MNG CO, LAKE MNG CO, MAHONDI ORE & STEEL CO, ONTARIO IRON CO, SAGAMORE ORE MNG CO, SYRACUSE MNG CO, UTICA MNG CO, VERMILLION MNG CO, WESTERN MNG CO, YOUNGSTOWN MINES CORP
(See Minn, Mich, Wis)

REPUBLIC STEEL CORP

25 Prospect Ave NW, Cleveland
Pres: T F Patton
VP: E R Johnson
Asst VP: E B Winning
Purch Agt: W T Adams
(See Ala, Mich, Minn, N Y)

RESERVE MINING CO

(Owned by Republic & Armco Steel Corp)
Guildhall Bldg, Cleveland 15
(See Minn)

SOUTH AGNEW MNG CO

1300 Leader Bldg, Cleveland 14
Pres: A F Peterson
VP: R C Fish, G W Humphrey
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Minn)

STANDARD SLAG CO, THE

1200 Wich Bldg, Youngstown
Pres: L A Begally
VP: W E Bliss
Sec: W H Kilcawley
Asst Sec: R M Levenson
Purch Agt: R L Stevenson
Ch Eng: A W Porter
(See Nev)

OKLAHOMA

AMER ZINC, LEAD & SMELT CO

Picher
Dist Mgr: J J Inmah
Gen Supt: O L Green
Geol: Dan R Stewart
Mech Eng: W F Netzeband
Met: R A Ammon
RIALTO, BARBARA J & LAWYERS MINES, undergr, Zn, Pb
Mine Supt: Bert Huddleston
Prod: 1,200 tons
1,200-TON GRAV-FLOT MILLS
Mill Supt: W H Shepard
(See Ariz, Ill, Mo, Ohio, Tenn, Tex, Wash, Wis)

BLACKWELL ZINC CO, INC

(Subsidi of THE AMERICAN METAL CLIMAX, INC)
61 Broadway, New York 6, N Y
Pres: H de Neufville
VP: W J Cloud, E T Rose, W E Long, J Vuillequez, J Payne, Jr, A E Lee
Sec: E A Wall
Treas: D J Donahue
Purch Agt: W F Price
Controller: H S Cohen

SMELTER, Blackwell
Mgr: M L Huggen
Prod: 86,000 tons Zn yearly
(See American Metal Co, Ltd, NY)

BUFFALO MNG CO, THE
Box 241, Picher
Pres: W L Childress
VP: Paul Childress
Sec-Treas: H L Childress
Purch Agt: Wm G Roberts
JOE BUFFALO MINE, 1 1/2 mi E
of Picher, undergr, Zn, Pb
Frm: Ben F Bailey

CONTACT MNG CO, INC
10 E Central Ave, Miami
(Box 549)
Pres: Orville Moore
VP & Gen Mgr: Finis Bryan
Sec: V W Sapp
Treas: G W Sapp
Asst Mgr: Orville C Moore
CONTACT MINE (SOUTHSIDE LEASE)
near Cardia, undergr, Zn, Pb
Prod: 200 tons

CORONADO MINES, INC
208 Wright Bldg, Tulsa 3
Pres: Milton Leon
VP: S P Bowyer
Sec-Treas: A F Bourne
(See Ariz)

EAGLE-PICHER CO, THE
MNG & SMELT DIV
1st Nat'l Bank Bldg, Miami
Pres: T Spencer Shore
VP & Gen Mgr: O A Rockwell
Asst to Gen Mgr: Claude Dale
Comptroller: G H Walbert
TRI-STATE MINES, Zn, Pb
Office Address: Cardia
Gen Mgr: J F Cuddeback
Asst Gen Mgr: J B Elam
Geol: Douglas Brock
Dir Personnel & Labor Rel: C D Wood
CENTRAL GRAY-FLINT MINE, Cardia
Mill Supt: Fred Phelps
ZINC SMELTER, Henryetta
Supt: John Wade
(See Ill, Kans, Nev, Ohio, Wis)

HARRISON GYPSUM, INC
P O Box 176, Lindsay
MINE, near Cement, surface, gypsum

KERR-McGEE OIL
INDUSTRIES, INC
Kerr-McGee Bldg, Oklahoma City
Pres: D A McGee
VP: A T F Seale (Shiprock, N Mex)
Sec: J H Lollar
Treas: S B Robinson
Purch Agt: D W Lindsay
(See Ariz, Colo, N Mex, Wyo, and
Kernac Nuclear Fuels, Colo, N Mex)

MARK TWAIN MNG CO, THE
Box 241, Picher
Pres: W L Childress
VP: W H Childress
Sec-Treas & Gen Mgr: M L Childress
Purch Agt: Wm G Roberts
Mine Frm: C A Enders
JARRETT MINE, 2 mi W & 3 mi N
of Picher, undergr, Zn, Pb
SKELTON MINE, 1 mi S of Picher,
undergr, Zn, Pb
(See Kans)

OZARK-MAHONING CO
MINING DIV
310 West 5th St, Tulsa 19
Chmn of Bd & Treas: S H Davis
Pres: C O Anderson
VP & Gen Mgr: A G Johnson
Sec: R T Lindmark
Compt: K R McWilliams
Gen Supt: W E Baile
Gen Supt, Western Div: R K Wisco
Supt of Mfg: Wayne W Foster
Supt of Mng: Ed Powell
Geols: E A Brecke, Forrest Hansen,
C W Tandy
Purch Agt: C W Schooky
(See Colo, Ill, N Mex)

PHILLIPS PETROLEUM CO,
MNG & MLG DEPT
Hartsville
Mgr: T M Wip
Tech Asst: Bradley Skinner
(See N Mex, Utah)

TONGAWA MINING CO
Box 368, Picher
Pres: Clarence A Miller
VP & Gen Mgr: O K Tucker
Sec: W A Brewer
KITTY MINE, 2 mi W of Picher,
undergr, Zn, Pb
Mine Frm: Leslie L Marcus

TULSA MINERALS CORP
Box 5216, Tulsa
Pres & Gen Mgr: J S Burden
VP: P T Thibodaux
Sec & Treas: W G Eastman
Purch Agt: John W Cleary
(See Ariz)

S A WALTON & SONS
Fairview
MINE, near O'Keene, Blaine County,
surface, gypsum

UNIVERSAL ATLAS CEMENT
CO
100 Park Ave, New York 17
WATONGA MINE, Blaine County,
surface, gypsum

W M & W MNG CO
Picher
MINE, Ottawa County, Zn, Pb

OREGON

ARENTZ COMSTOCK MINING
VENTURE
870 First Security Bldg,
Salt Lake City, Utah
BREYER MINE, McDermitt, open pit,
Mercury
Gen Mgr: Sam S Arentz
Gen Supt: Roy Nickman
Asst Supt: Paul Sorenson
Mine Eng: William Deason
150 TON FLOT MILL, at mine
Mill Supt: Roy Nickman
(See Utah)

PAT ARNOT DRILLING &
EXPL CO
1801 Hwy 199, Grants Pass
Own: Pat Arnot
BLACK HAWK MINE, undergr,
placer, Salt Rock, Cr-A
Idle

ASHLAND MINING CO
835 N Main St, Ashland
Mgr: Dewey & Fred Van Curier
ASHLAND MINE, 3 mi NW of
Ashland, undergr, WO₂, Cr
50-TON GRAY MILL & CONCEN
MATTER MINE, 2 mi N of
Ashland, undergr, WO₂
Prod: 5-10 tons

BRISTOL SILICA CO
Box 427, Rogue River
Pres: Fayette I Bristol
BRISTOL MINE, 3 mi E of Rogue
River, surface, silica
Mine & Mill Supt: Rolland Jones
Cons Eng: A O Bartell
Prod: 200 tons
MILL, Rogue R, Cap: 100 tons

COBAR MINES INC
Box 731, Redmond
Pres & Geol: Frank Reid
VP: Keith Parkinson
Sec-Treas: George Rakestraw
MOTHER LODE & ROUND MT MINES,
Crook County, open pit, Hg
Under devel

CORDERO MINING CO
131 University Ave, Palo Alto, Calif
Gen Mgr: J Eldon Gilbert
HORSE HEAVEN MINE: Ashwood
46 mi E of Madras, undergr, surface,
Hg
Gen Supt: Verne Haas
Mine Supt: F E Lewis
Gen Frm: C J McClain
Prod: 30 tons
30-TON ROAST MILL, 17 mi E of
Ashland
(See Calif, Idaho, Nevada)

AL DUNN CONCENTRATING
PLANT
Canyon City
Own: Albert Dunn
CARLSON MINE, Dog Creek Rd,
Canyon City, open pit, Cr
Mine Frm: Lawrence Robo
Prod: 25-30 tons
30-TON GRAY MILL

EICKEMEYER BROS
Post
MAURY MT MINE, Crook County, Hg

FINDLAY, GLENN
Box 41, Canyon City
KINGSLEY MINE, Grant County,
undergr, Cr
Gen Mgr: Randy Sintay
Prod: 175 tons annually

GARDNER MNG CO
Canyon City
Part: Wm W, John & Wm N Gardner
HAGGARD & NEW MINE, Grant
County, Cr
WARD & ZERO MINES, Grant
County, Cr
Idle

GALLAHER, J G
716 NE "A" St, Grants Pass
OREGON CHROME MINE, Josephine
County, Cr

GRABNER, KENNETH
2310 Second St, Baker
RECORD GOLD MINE, Baker,
undergr, Au
Under devel
10-TON MILL, at mine

GREAT LAKES CARBON
CORP, MNG & MLG PROD DIV
Terrebonne
PLANT NO 2, surface, diatomaceous
earth
Supt: E W West
(See Calif, Colo, Nev, N Mex, NY)

HANNA COAL & ORE CORP,
ORE DIV, (SUBSID OF M A
HANNA CO)
P O Box 305, Riddle
NICKEL MTN MINE, surface, Ni
Gen Mgr: E S Mollard
Mine Supt: E J Maney
Mine Frm: H J Servant
Mine Eng: W A Foster
Prod: 6,000 tons
(See Mich, Ohio)

HANNA NICKEL SMELTING
CO, (SUBSID HANNA COAL
& ORE CORP)
Box 305, Riddle
Gen Mgr: E S Mollard
ELEC MELT PLANT
Pl Mgr: E E Coleman
Supt: L E Rosner
Prod: 17,000,000 lbs nickel yearly

HI-POTENTIAL MINES
Main & River Sts, Cottage
Grove
Owner: Ray E Nelson
UTOPIAN, SWEEPSTAKES &
HIAWATHA GROUPS, 36 mi SE
of Cottage Grove, undergr, Au, Ag,
Cu, Pb, Zn
Under devel
5-TON GRAY MILL, Bohemia
VESUVIUS MINE, Bohemia, undergr,
Au, Ag, Cu, Pb, Zn, Mn
(Under lease)

KINSELLA & LAMBRETH
John Day
Part: Jim Kinsella, David Lambeth
LAST CHANCE MINE, Grant County,
Cr

LAKEVIEW MNG CO
Marble Theatre Bldg, Lakeview
Pres: Dr Garth W Thornburg
VP: John Murchison, Perry Bass
Sec: T R Conn
Asst Sec: Vance Thornburg
WHITE KING & LUCKY LASS MINES,
18 mi NW of Lakeview on Auger Creek,
undergr, U₂O₈
Gen Mgr: James F Poulos
Geol: Howard B Duto
Asst Geol: Philip S Wain
Mine Frm: Carroll Flick
Under devel

MALHEUR MNG CO
411 NW 8th, Pendleton
Pres: Elton B Taylor
VP: Norman Warnstrom
Sec: Wm Morrison, Jr
RED DYKE MINE, Rte 1, Huntington,
open pit, Au
Prod: 15 tons
15-TON MILL, near Malheur City,
Malheur County

MIA MINES, INC
Box 362, Prineville
Pres & Geol: Frank O Reid
Sec-Treas: J H Douglas
BLUE RIDGE MINE, open pit, Hg
40-TON MILL, Ochoco dist

MINERAL KING MINE
34 S River Rd, Cottage Grove
Own: Harry Williams, Roy Nelson
MINE, Bohemia dist, undergr, Cu,
Au
Under devel

MOOTHART & WRIGHT
Box 482, John Day
Part: Arthur Moothart, Wm Wright
RED HILL, DRY CAMP & CURTIS
MINES, Grant County, Cr

OLSSON, HAROLD &
PRINGLE, E W
Ronan, Montana
GLASS BUTTE MINE, Lake County,
Id
Under devel

OREGON CHROME MINES,
INC
Box 475, Grants Pass
ROBERTSON CHROME MINE, Oak
Glen, 15 mi NW of Selma, undergr,
Cr
Gen Mgr: William S Robertson
Supt: C O Anderson
Prod: 10 tons

PATTEN, W B
Culp Creek
EL CAPITAN QUARTZ & GLENWOOD
PLACER, St PETERS Cr, Bohemia dist,
Au, Sb, Pb, Cu, Zn
Prod: 10 tons

PROFILE TAMARACK MINES
CO
c/o E P Slovarp, 308 SW 4th Ave,
Portland 4
Pres: Charles E Thompson
VP & Purch Agt: Henry T Abstein
Sec-Treas: Emile P Slovarp
(See Idaho)

SEIFERT LUMBER CO
Selma
Part: J T & T K Seifert
BRIGGS CREEK MINE, 34 mi W of
Selma, open pit, undergr, Cr
Prod: 4 tons
20-TON MILL, Selma

O W STUEMPEGES & SONS
Box 8, Myrtle Creek
(M) MINE, Douglas County, Cr, Cu,
Fe
Idle
"B" MINE, open pit, Cr, Fe
Under devel

SUNBURST URANIUM COR-
PORATION
1975 NW Everett St, Portland 9
Chmn of Bd: Walter N Schwedler
Pres: James C Young
Exec VP: Dr Sam B Liu
VP: Ernest L Miller, Harold F
Ridings, Dr Bryan D Lee
Sec-Treas: Kay Critchlow
(See Nev, Utah)

UNITED PACIFIC MNG CORP
2675 Willamette St, Eugene
Pres: Roy C Barr
VP: M L Gase
Sec: A Elman
Treas: Warren C Glade

VAD-ORES EXPLOR CO
633 Med Arts Bldg, Portland
Pres: V E Rudy
Sec-Treas: T R Fyock

C C WIKSTROM
Box 238, Powers
ROCK CREEK CHROME MINE,
Coos County, undergr, open pit, Cr
Prod: 3 tons
FOSTER CREEK SHROME MINE,
placer, Cr
Idle

WINTER CREEK MNG CO
5121 SW Cameron Rd, Portland
WINTER CREEK MINE, Crook
County, Hg
Idle

PENNSYLVANIA

ALAN WOOD STEEL CO
Conshohocken
Pres: H R Wood
VP Oper: W E Boger
Sec: W B Cashmore
Treas: W M Webb
Met: L A Mohr
Ch Eng: F C Schoen
Dir, Personnel: C D Dorworth
VP & Compt: H W Read
(See N J)

ALUMINUM CO OF AMERICA,
MINING DIV
1501 Aloa Bldg, Pittsburgh 19
Pres: P L Magee
Sec: Alfred M Hunt
Treas: E B Wilber
Purch Agt: Ralph Keefe
Gen Mgr in Ch: Lawrence Litchfield, Jr
(See Ark, Ill)

AMERICAN METAL CLIMAX, INC. CLIMAX MOLYBDENUM CO DIV

Langeloth
(See Colo, N Y)

AMERICAN METAL CLIMAX, INC. DUQUESNE DIVISION

41 Broadway, New York 6, N Y
SMELTER, Pittsburgh, Zinc-base alloy production
Mgr: W F Tschappat
(See NY)

BESTWALL GYPSUM CO

120 E Lancaster Ave, Ardmore
Pres: Rawson G Lizare
Exec VP: Malcolm Meyer
Sec: Arthur D Graves
VP & Treas & Compt: J R Johnston
Purch Agt: J I Trolley
Asst Sec & Treas: J L Strickland
(See Iowa, Kans, Mich, N Y, Tex, Utah)

BETHLEHEM CORNWALL CORP

701 E Third St, Bethlehem
Pres: A F Peterson
Mgr: S J Shale
CORNWALL MINE, Cornwall, Pa., Cu, Au, Ag, S
6,000-TON MAG CONCENTRATOR
2,500-TON FLOT PLANT
1,600-TON SINTERING PLANT
GRACE MINE, Morgantown, Pa, S
MAG COSC, FLOT PLANT, pelletizing plant

FOOTE MINERAL CO

18 W Chelten Ave, Philadelphia 44
VP & Sec: W F Wilson
VP: F B Shay
Sec: W R Spofford
Treas: J S Gates
Purch Agt: W M Raynor
Gen Prod Mgr: W B Townner
(See N H, N C, Tenn, Va)

INTERNAT'L SALT CO, INC

Scranton
Pres: Edward L Fuller
VP: H J Osborn, John L Ryco, Mortimer B Fuller, Jr
Edson K Green, Myron L Hyman
Sec: H J Osborn
Treas: M B Fuller, Jr
(See N Y)

JONES & LAUGHLIN STEEL CORP

3 Gateway Center, Pittsburgh 26
Pres: H C Adams
VP: Pres: A T Lawson
Gen Mgr, Ore Mines & Quarries: C C Henning
Sec: D F Jones, 3rd
Treas: H H Wunderlink
(See Mich, Minn, N Y)

MOLYBDENUM CORP OF AMERICA

Washington
Wks Mgr: Eugene F Lones
PLANT, Washington, Mo, WO₃
PLANT, York, Mo WO₃, rare earths
Mgr: W F Allen
(See Calif, Colo, N Mex, N Y)

NEW JERSEY ZINC CO

R D #1, Centerville Valley
MINE, Friedensburg
Supt: B S Huettel
(See Colo, Ill, W J, N Mex, N Y, Tenn, Va, Wis)

ST JOSEPH LEAD CO

250 Park Ave, New York 17, N Y
SMELTER, Josephtown
Mgr: John G Wehn
(See Mo, N Y)

SNYDER MINING CO

312 Oliver Bldg, Pittsburgh
Pres: W P Snyder, Jr
VP & Gen Mgr: A L Fairley, Jr
Sec: W Laird Davis
Treas: J K Foster
(See Minn)

U S STEEL CORP

525 William Penn Place, Pittsburgh 33
(See Alaska, Ala, Calif, Minn, Tenn, Utah, Wyo)

SOUTH CAROLINA

COMMERCIALORES, INC

Box 98, Clover
Pres & Gen Mgr: A R Eckel
VP: H S Doty
Sec: E A Jacobs
Purch At: H L Wright
HENRY KNOB MINE, 4 mi W of Clover, surface, kyanite, pyrite
Gen Supt: John Strohl
Mine Supt: Leonard Hardin
500-TON FLOT MILL, at mine
Mill Supt: Richard Lachmund
Asst Mill Supt: John McGill

HEAVY MINERALS CO

4000 N Hawthorne St, Chattanooga, Tenn
Pres: J Carlton Ward, Jr
VP: John M Frame
Sec: K L Karr
Treas: Wm W Stephens, Jr
MARINE MINERALS PLACER, Box 206, Clearwater, monazite, rutile, zircon, ilmenite, staurolite
Gen Mgr: H C Laird
Mine Supt: Grant Leeson
Geol: C C Woo
Eng: C C Cook
Met: John C Craig
Mine Eng: John M Munsterider
MILL, Clearwater
Supt: M L Luckey
(See Fla, Tenn)

INDUSTRIAL MINERALS INC

York
Pres & Gen Mgr: L G Wilson
VP & Sec: W F Wilson
KINGS CR MINE, 14 mi W of York, surface, barite
Prod: 15 tons
KINGS CR MILL, 45-ton, crush & grind

MINERAL MNG CORP

Lancaster
MINE, undergr, sericite mica
Supt: Frederick Bingham

SOUTH DAKOTA

AMERICAN COLLOID CO

Belle Fourche
BELLE MINE, surface, bentonite
Mgr: Claude Accord
Prod: 600 tons
(See Ill, Miss, Wyo)

BALD MOUNTAIN MNG CO

Trojan
Pres: O D Collier
Sec: M Stevens
Treas: Ward Reidesel
Gen Mgr: F A Miller
Elec Eng: W L Hendrickson
Shop Frnt: M Wood
PORTLAND, CLINTON, DAKOTA, DECORAH, GOLD BUG MINES, Trojan, undergr, open pit, Au, Ag
Mine Supt: J Lauritsen
Asst Mine Supt: F Zupet
Mine Frnt: H Brown, J Giachetto, J Marsh, E Eckhart
350-TON CYANIDE MILL, Trojan
Mill Supt: B Olson
Mill Frnt: R Shoop
Assay: Lloyd Lewis
(See Iowa)

BARCO MINERALS INC

Box 432, Sturgis
Pres: Richard B Williams
VP: M H Braden
Sec-Treas: Ruth I Williams
SPOOKY JOE MINE, open pit, U₃O₈, V₂O₅
Gen Supt: M H Braden
Geol: W J Lang, Fred R Williams
Mine Eng: Don Braden
Prod: 10 tons

BLACK HILLS KEYSTONE CORP

Keystone
Pres: W K Wallace
Lepidolite, mica, tantalite, feldspar, beryl
50-TON FLOT MILL
Mgr: A I Johnson

BLACK HILLS URANIUM CO

Box 381, Edgemont
Pres: Roy E Chord
VP: Eugenia O Chord

Sec: Gordon F Kamerer
Dir: Charles M Webber
HOLDUP NO 15, 17, KADOS NO 3, 11 MINES, undergr, open pit, U₃O₈, V
Gen Mgr: Roy E Chord
Geol: Gordon Prescott
Mine Supt: Walter McKenna
Asst Mine Supt: Richard W Chord
Prod: 100-200 tons
Under devel

COMMONWEALTH MNG CO OF S D

Box 892, Sioux Falls
Pres: Merle M Johnson
VP: John C Nott
Sec-Treas: Oscar Shaktad
COMMONWEALTH MINE, Deadwood, undergr, surface, U₃O₈, Au, Ag
Gen Mgr: Martin Bronsahan
Geol-Met: Alex McHugh
Under devel
(See Utah)

GIANT CYCLE CORPORATION

Box 1028, Edgemont
Res Asst Mgr: Edgar M Gillenwaters
GOULD LEASE, 12 mi N of Edgemont, Fall River County, undergr, U₃O₈
FREEZEOUT MINE, 20 mi NW of Edgemont, Fall River County, undergr, open pit, U₃O₈
TAYLOR MINE, 25 mi NW of Edgemont, Fall River County, open pit, U₃O₈
Gen Supt: Robert Rock
(See Colo)

HOMESTAKE MNG CO

Lead
HOMESTAKE MINE, undergr, Au
Mgr, Black Hills Oper: James O Harder
Mine Supt: C N Kravitz
Asst Mine Supt: W C Campbell
Ch Geol: A L Slaughter
Ch Mech Eng: LeRoy Seybers
Ch Met: C E Schmidt
Ch Elect Eng: C L Gust
Safety Eng: Phil Graves
Purch Agt: F E Bryan
Prod: 4,500 tons
4,500-TON CYAN MILL, at mine
(See Calif, Utah, Wyo)

INGERSOLL MINE

Keystone
Consult Mng & Met Eng: A I Johnson
MINE & MILL, 2 mi NW of Keystone, undergr, open pit, pegmatite minerals

INTERNAT'L MINERALS & CHEMICAL CORP

20 N Wacker Dr, Chicago 6, Ill
Western Plants, Gen Supt: J W Mitchell, Keystone
MINES, Custer, open pit, feldspar
300-TON MILL, Custer, dry grinding
Plant Supt: R H Brigham
Mine Supt: A E Boone
Mine Frnt: Felix VanOverschild
MINE, Keystone, open pit, feldspar
75-TON MILL, Keystone
Mine Supt: A E Boone
Mine Frnt: Irven Green
(See Ariz, Colo, Fla, Ill, Me, Miss, N Mex, N C, Ohio, Tenn, Va, Wyo)

PETER LIEN & SONS

Box 1072, Rapid City
Pres: Peter C Lien
VP: Charles N Lien
Sec-Treas: Bruce A Lien
QUARRY & KILN, limestone
Gen Supt: Robert Grothe
Geol: Ray Smith
Mine Supt: Al Johnson
Elec Eng: Elmo More
Prod: 1,000 tons

LITHIUM CORP OF AMERICA INC

2500 Rand Tower, Minneapolis 2, Minn
Pres: H W Rogers
MINES, near Hill City, undergr, surface, Li
Gen Mgr: John C Talley, Sr
FLOT-MILL, Hill City
Supt: Carleton B Harris
(See Minn, N C)

LUTAH URANIUM & OIL, INC

746 Petroleum Bldg, Roswell, New Mexico
Pres: Gordon E McMeen
VP: Homer F Glover
Sec-Treas: David J McKee
MCLEOD MINE, Edgemont, open pit, U₃O₈, V₂O₅
Gen Mgr: Harry Engman, Jr
Asst Gen Mgr: Earl Long
Under devel

MAYWOOD CHEM WORKS

Hunter Ave, Maywood, N J
ETTA MINE, Keystone, spodumene
Mgr: Dewey Peterson

McKENNIE GULCH MNG CORP

Box 460, Sturgis
Pres: E G Brown
VP & Gen Supt: Donald L Cammach
Sec: J W Kowing
Treas: Andy Wagner
Purch Agt: Tom Wagner
MARIAN MINE, open pit, U₃O₈
Gen Mgr: Andy Wagner
Asst Gen Mgr: Tom Wagner
Under devel

MINES DEVELOPMENT, INC

17 Garmers Union Bldg, Denver 3, Colo
Exec VP & Gen Mgr: Allen D Gray
Sec-Treas: W H Hoadley
Prod Mgr: George T Bator
400-TON MILL, Edgemont, Resin-in-pulp
Mill Supt: H D Webb
Mill Frnt: G H Bryant
Ch Chem: R F Stoker
(See Colo)

MINERALS MILLS, INC

Custer
Pres: Albert Gushurst
Sec & Gen Mgr: A I Johnson
GLENWOOD MINES, 4 mi NW of Custer, mica
Under devel

MONTANA CHEMICAL & MILLING CORP

Box 1058, Edgemont
Pres: James Wootten
VP: Wm J Kinick
Sec: Isaac Mellman
Purch Agt: William Kinick
RUDA & DEXTER GROUP, undergr
Gen Mgr: M J Brown
Asst Gen Mgr: E Read
Mine Supt: Vernon Martin
Prod: 100 tons
(See Pictograph Mng & Uranium Co, Inc)

PICTOGRAPH MNG & URANIUM CO, INC (Subsidi of MONTANA CHEM & MLG CORP)

Box 1058, Edgemont
RUNGE MINE, U₃O₈, V₂O₅
Gen Mgr: Gerald C Mathis
Mine Frnt: Vernon Martin

RIMROCK MNG CO, INC

Box 278, Sturgis
Pres & Gen Mgr: W R Peregrine
VP: Roswell Bottom
Sec-Treas: R J Ray
RIMROCK MINE, open pit, U₃O₈
Under devel

SCOTT'S ROSE QUARTZ CO

Custer
Mgr: Frank S Scott
RED ROSE & MOUNTAIN ROSE MINES, nr Custer, pegmatite minerals

SODAK URANIUM & MNG CO, INC

Evans Hotel Annex, Hot Springs
Pres & Gen Mgr: Clyde R Boyle
VP: W E Haldane
Sec: Paul Russell
(See Wyo)

SUNDANCE PETROLEUM & URANIUM CO

Box 283, Spearfish
Pres: Howard H Holdcroft
VP: Robert P Mulder
Sec: R G May
Treas: Gaylord Smith
(See Wyo)

TENNESSEE

AMER ZINC CO OF TENN

(Subsidi of AMER ZINC, LEAD & SMELT CO)

Mascot
VP: H A Coy
Purch Agt: C C Sisk
Mgr: Wm Black
Gen Supt: M J Langley
Supt of Mines: Harry L Miller
Ch Eng: W N Johnson
Ch Geol: Chas R L Odeh
Mech & Elec Supt: I D Campbell
Personnel Dir: J L Allison
Safety Eng: Harold Thompson

Asst Mine Supt: R L Brittain
MASCOT NO 2 MINE, Mascot
YOUNG MINE, Hodges Station
NORTH FRIENDS STATION MINE,
Hodges Station
GRASSELLI, New Market
COY MINE, Jefferson City
ALL MINES, undergr, zinc, sulphide
conc
4,000-TON FLOT-GRAY MILL, HMS,
Jigs, Mascot
Mill Supt: D B Grove
Ch Chem: D E Chadwick
(See Ariz, Ill, Mo, Ohio, Okla, Tex,
Wash, Wis)

ARMOUR FERTILIZER
WORKS, INC
Columbia
Supt: W B King
PHOSPHATE MINE
(See Fla)

B & T MNG CO
Box 652, Bristol
Part: Harold D & J E Tipton
B & T MINE, Johnson County, open
pit, Mn
Gen Supt: J R Sluder
Prod: 10 tons

COLUMBIA ROCK PROD
CORP

Pressnell Bldg, Columbia
Pres: Wayne Pressnell
VP: Harry Pressnell
Sec-Treas: Wm C Fraser
Purch Agt: W J Davis
MINE, undergr, limestone
Gen Mgr: Harry Pressnell
Prod: 2,000 tons
2,000-TON MILL, Columbia

CONSOL HIGH GRADE ORE CO

Calhoun
Parts: G S Murray, I D Murray,
J D Murray
MINE, Calhoun, open pit, Ba
Mine Supt: Earl Sledge
Under devel

FELDSPAR CORP, THE
Spruce Pine, North Carolina
FLOT MILL, Erwin
(Subsld of Pacific Tin Consol Corp,
NY)
(See Ga, N C)

FOOTE MINERAL CO,
ELECTRO MANGANESE DIV

1400 Loraine, Knoxville 1
Div Acct: Otto Neumann
TWO PLANTS, Knoxville
1323 Proctor Street
1400 Loraine Street
(See N H, N C, Pa, Va)

HARSH PHOSPHATE CO
760 Murfreesboro, Nashville 10
Gen Mgr: M G Marsh
Sec: T L Harsh
MINE, 3 mi SE of Nashville, surface,
ground, phosphate rock
Prod: 125 tons

HEAVY MINERALS CO
4000 N Hawthorne Ave, Chattanooga
Pres: J C Ward, Jr
VP: J M Frame
Sec: K L Karr
Treas: W W Stephen, Jr
Gen Mgr: H C Laird
(See Fla, S C)

HIGHLAND MINING CORP

Centerville
Pres & Gen Mgr: Bill Davis
VP: D Brown
Sec: M Brown
HIGHLAND MINE, Centerville,
surface, phosphate rock
Prod: 700 tons

INTERNAT'L MINERALS
& CHEMICAL CORP
20 N Wacker Drive, Chicago 6, Ill
CONSOL FELDSPAR DEPT, Erwin
Prod Mgr: Charles Hunter
Asst Prod Mgr: J R LeGrand
Purch Agt: Paul Willis
MICA PLANT, Erwin; dry grinding
Gen Supt: J R LeGrand
100-TON MICA FLOT PLANT,
Greenville
Gen Supt: Phil Thomas
(See Ariz, Colo, Fla, Ill, Mo, Miss,
N Mex, N C, Ohio, S D, Va, Wyo)

MONSANTO CHEM CO

Columbia
MINE, 8 mi SW of Columbia, surface,
dragline excav, phosphate
Gen Mgr: J L Christian

Asst Gen Mgr: H F Weaver
Purch Agt: E L Sanderlin
Mine Supt: H A Webster
Asst Supt: J W Steenbergen
Furnace Supt: R B Shaffner
Mech Eng: W G Allen
Elec Eng: R L Van Fossen
Safety Eng: H E Coker
Prod: 2,800 tons
GRAY MILL
ELEC FURN, 25,000-kw, yellow
phosphorus
(See Idaho, Mo)

NATIONAL LEAD CO

Sweetwater
Mine & Mill Supt: J T Kelm
MINE, surface, barite
MILL, washing, jiggling, grinding
(See Ark, Calif, Kans, La, Mo, Mont,
N Y, Tex, Wyo)

NEW JERSEY ZINC CO

160 Front St, New York 35, N Y
JEFFERSON CITY MINE, Jefferson
City, undergr
Gen Supt, Tenn Oper: Johnson Crawford

Supt: F H Main
Mine Supt: A C Savage
MILL
Mill Supt: J E Nelson
Asst Mill Supt: R E Daugherty
FLAT GAP OPERATION, Treadway
Supt: R L Sayre
(See Colo, N J, N Mex, N Y, Pa, Va,
Wis)

PRESSNELL PHOSPHATE CO,
INC

Pressnell Bldg, Columbia
Pres: Wayne Pressnell
VP: Harry Pressnell, H R Mosley
Sec-Treas: W J Davis
Asst Sec-Treas: Wm C Fraser
MINE, surface, phosphate
Prod: 1,000 tons
150-TON FLOT MILL, Columbia

RIVER & RAIL PHOSPHATE
CO

135 2nd Ave N, Nashville
Pres & Gen Mgr: L H Jordan
Sec: S E Wheeler
Gen Supt: Claude Warren
MINE, 6 mi NW of Nashville, surface,
dragline, raw phosphates
Isis
PLANT, Jordon, Tenn

SOUTHERN MICA CO

Johnson City
Pres & Gen Mgr: C Bailey Rice
VP: Martha R McClain
Sec-Treas: B F McClain
400-TON GRAY MILL, Johnson City
Mill Supt: J F Reynolds
Mill Frms: Haskell Garland
(See NC)

TENNESSEE COPPER CO

Copperhill
BURRA BURRA, EUREKA, BOYD,
CALLOWAY, MARY MINES, Duck-
town, Polk County, undergr,
Sulphuric acid, Fe, Cu, Zn
Pres: T A Mitchell
Mgr: R B Burns
Gen Supt: L Weaver
Geol: Owen Kingman
Elec Eng: L B Murray
Mine Supt: H F Kendall
Asst Mine Supt: R G Clay
Prod: 110,000 tons per month
110,000-TON FLOT MILL, Ducktown
Mill Supt: F M Lewis
Asst Mill Supt: James Goodman
REVERB SMELTER, Copperhill
Supt: W Y Querry
Asst Supt: W F Hardin
Output: 20,000,000 lbs Cu yrly
(See NY)

TENNESSEE VALLEY
AUTHORITY

Knoxville
KNOB CREEK, Columbia, 3 mi N
of Columbia, surface, phosphate
Gen Mgr: Aubrey J Wagner
Gen Supt: V S Wildsmith
Geol: R S Ingle
Mech Eng: Henry T Putz
Safety Eng: J M Sisson
Mine Supt: Charles A Irwin
Prod: 350 tons

U S STEEL CORP, TENN
COAL & IRON DIV

Jefferson City
ZINC MINES WORKS
Gen Supt: R T Wilson
Geol: S K Mynatt
MINE, undergr, open pit, Zn

Mine Supt: C E Piper
Mine Frms: H H Kerr
Mine Eng: J A Miller
FLOT MILL
Mill Supt: J A Rhoton
(See Alaska, Ala, Calif, Minn, Pa,
Utah, Wyo)

VIRGINIA-CAROLINA CHEM
CORP

401 E Main St, Richmond, Va
MINE, Mi Pleasant, open pit,
phosphate rock
Mgr: M D Girardeau
(See Fla, Va)

VIRGINIA COAL, IRON &
COKE CO

P O Box 1871, Roanoke, Va
STONE CREEK MINE, Carter County
Va

TEXAS

AMBASSADOR OIL CORP

Box 9338, 3101 Winthrop Ave,
Ft Worth
Pres: F Kirk Johnson
VP: C Harrison Cooper
VP & Treas: W V Coffey
Sec: John Fallwell, Jr
(See Colo)

AMERICAN SMELTING &
REFINING CO

Box 1111, El Paso
Mgr: Ben D Roberts
Asst Mgr: Robt M McGeorge
EL PASO SMELTING WORKS, 2 mi
N of El Paso, Pb, Cu smelting &
converting, Zn fuming
Supt: T J Wodside
Pl Eng: J W English
Supply Agt: R E Redman
(See Ariz, Calif, Colo, Idaho, Ill,
Kans, Md, Mont, Neb, N J, N Mex,
N Y, Utah, Wash & Fed Mng &
Smelting Co, Mo)

AMER ZINC CO OF ILLINOIS

(Subsld of AMER ZINC, LEAD &
SMELT CO)
Box 577, Dumas
RETORET SMELTER, Dumas
Mgr: W E R Smith
Supt: G R Beilig
Pl Eng: C R Griffin
Purch Agt: W G Hollifield
Vice Mgr: J C Kersten
Output: 100,000,000 lbs Zn yrly
(See Ariz, Ill, Mo, Ohio, Okla, Tenn,
Wash, Wis)

BALCONES CORP

403 E Travis St, San Antonio
Chmn of Bd: J R Manion
Pres: Collins B Cook
Sec: Billie Manion
Treas: T J Manion
(See Ariz)

CAPITAL-SEABOARD CORP

900 Oil & Gas Bldg, Wichita Falls
Pres: Joseph H Corbin
Exec VP & Gen Mgr: Charles W Yetter
Sec: William A Pope, Jr
Treas: Howard L Corbin
(See Ariz, Idaho, Mont, N Mex, Utah)

CINDERELLA URANIUM &
OIL, INC

905 McBurnett Bldg, San Angelo
Pres: Marvin C Hans
VP: Royal Hart
Sec: Douglas A Williams
Treas: Jas E Robinson
Field Rep: Holvey H Enocha
Tom W Enocha
(See Colo)

CUBA INTERNAT'L MNG
& DEVEL CO, INC

522 Meadows Bldg, Dallas
Pres: Kenneth J Rich
VP: Celyn Hedges
Sec: Harry Selders
Gen Mgr: Glen Fassler
Explur

DUVAL SULPHUR & POTASH
CO

17th Fir Mellie Esperson Bldg,
Houston 2
Pres: W F Morris
VP & Treas: Eugene German
Sec: V J Thornhill
ORCHARD MINE, 2 mi SE of
Orchard, sulphur
Acting Res Mgr: K T Stoddard
(See N Mex, Ariz)

GARZA MNG CO

Box 171, Fort

GARZA MNG CO
Box 171, Fort Worth
MINE, open pit, U.O.
Mine Supt: C L Brownlow

GENERAL MINERALS CORP

440 Meadows Bldg, Dallas 6
Pres: S Y Guthrie
VP: S Y Guthrie, III
Sec-Treas: F H Connally
Asst Sec-Treas: J A Barnett
(See Colo)

JEFFERSON LAKE SULPHUR
CO

1408 Whitney Bldg, New Orleans 12,
La

CLEMENS DOME MINE, Brasoria

County
VP & Gen Mgr: Harvey A Wilson
Asst Gen Mgr: L V LeBeuf
Purch Agt: Carl McElrath
LONG POINT DOME, Fort Bend
County
(See La)

KIRK BASIN URANIUM CORP

3101 Winthrop Ave (Box 9338)
Ft Worth
Pres: Richard O Dulaney, Jr
VP: C Harrison Cooper
Sec-Treas: W V Coffey
MINE, In Colo
(See Colo)

LONE STAR MERCURY INC

Box 458, Alpine
MINE, Terlingua dist, Brewster
County, Hg

LONE STAR STEEL CO

Box 12226, Dallas
Pres: E B Germany
Exec VP: W H Johnson
VP Oper, Res & Tech Devel:
L G Grasper
VP Sales: W T Moreland
VP Pb Rel & Adv: L D Webster
VP Purch & Sec: J M Morris
VP & Compt: Max Dodson
Works Mgr: J M Brashear
Asst Gen Supt-Iron Div: S G Anderson
Asst Gen Supt-Steel Div: J A Carroll
Div Supt-Coal Mines: C R Cameron
COKE, IRON & ORE DIVISION
Supt-Coke & By-Products: D G Burns
Supt-Blast Furnace: F G Stark
Supt-Fdr: A C Harrell
Div Supt-Ming, Benef & Geol:
A B Drescher
Ming Engr: V F Malone
Chief Con Engr: J M Clements
Gen Frm, Beneficiation: Vernon Camp
Gen Frm, Ming: R T Dudley
STEEL DIVISION
Supt-Rolling Mill: H I Arrington
Supt-E W Pipe Mill: L Eller
Supt-Open Hearth: S M Purcell
SERVICES
Dir-Indus Rel: P C Russell
Chief Elec Engr: J H Harper
Chief Indus Engr: W L Smith
Safety Dir: S E Beasley
LONE STAR MINES, BLACK MT,
HUGHES SPRINGS, ROGERS, KING
& OTHERS - TEXAS
12,000-TON MILL, GRAVITY,
CALCINING & SINTERING
BLAST FURNACE
Cap: 1,300 Tons daily

MAGNET COVE BARIUM
CORP

Box 6504, Houston 5
MINE, Zausella, open pit, clay
Div Mgr: C L Wilkinson, Jr
Plant Mgr: A T Donovan
250-TON MILL, dry grinding
Mill Frms: Robert Chambers
(See Ark, Fla, Mo, Nev, Wyo)

MILWHITE COMPANY, INC

Box 15038, Houston 20
Pres: Max B Miller, Jr
VP: F A Frank
VP & Gen Mgr: A B Willis
MINES, Flatonia & Riverside
PRODUCERS of bleaching clays,
insecticide, diluents, & carriers,
barite, celestine, talc, fuller's
earth, bentonite, fluorapatite, expanded
perlite, fillers & bauxite
(See Ga)

MORTON SALT CO

150 So LaSalle, Chicago 3, Ill
MINE, Grand Saline, salt
Gen Mgr: Field Lessor
Asst Gen Mgr: J L Sellers
Mng Eng: M R Barker
Prod: 600 tons
(See Ill, Kans, La)

NASH MINES

405 Nash Bldg, Austin
Own: Jas P Nash
(See Ariz)

NATIONAL LEAD CO.**BAROID DIV**

Box 1875 Houston
Gen Mgr: O B Coale
Asst Gen Mgr: J W Hofstetter
Asst to Gen Mgr: E J Hagstette, Jr
H H Farnham
Prod Mgr: Reginald Rowland
CORPUS CHRISTI PLANT, barite,
dry grinding mill
Mill Supt: T A Snider
HOUSTON PLANT, bentonite, barite,
dry grinding mill, oil well chem
Supt: R J Penrose
MULDOON MINE, Muldoon
bentonite, surface
Supt: R J Penrose
TEXARKANA PLANT, Texarkana,
oil well chem, dry grinding
Compt: Claude Notson
(See Ark, Calif, Kans, La, Mo, Mont,
N Y, Tenn, Wyo)

**NATIONAL LEAD CO, TEXAS
MINING & SMELTING DIV**

Box 558, Laredo
Mgr: J C Archibald, Jr
Ch Chem: Fidel Gonzales
Compt: Claude Notson
REVERB & BLAST FURNACES,
FUMING PLANT, Highway 81,
N Laredo
Plant Supt: R L Kulpeca
(See Ark, Calif, Kans, La, Mo, Mont,
Nev, N Y, Tenn, Wyo)

PAN-AM MNG CO, INC

Panhandle
Pres & Gen Mgr: Clarence C Williams
VP: C E Lyles
Sec: E G Stapp
Treas: Cyril Pingleton
(See Ariz)

**PHELPS DODGE REFINING
CORP** (Subsidiary of PHELPS DODGE
CORP)

Box 1372, El Paso
ELEC COPPER REFINERY, COPPER
SULPHATE PLANT, also NISO, So, Te
Works Mgr: E W Donahue
Asst Works Mgr: B B Kunkle
Prod: 876,000 refined cu yrl
(See Ariz, N Mex, N Y)

**RARE METALS CORP OF
AMERICA**

1st Security Bldg, Salt Lake City
Utah
(Subsidiary of EL PASO NATURAL GAS
CO, Texas St at Stanton, Box 1492,
El Paso)
Pres: C L Perkins
VP & Asst Gen Mgr: M H Kline
(See Ariz, Calif, Idaho, N Mex, Utah)

RADIATION EXPLOR CO, INC

Box 151, Henrietta
Pres: C L Brownlow
VP: James W Heath
Sec: Paul Eggers
TWIN RATTLER & CROWN MINES,
Post, open pit, U₃O₈
Gen Mgr: C L Brownlow

SHEFFIELD STEEL COMPANY

Box 3129, Houston
MINES, Fe

**SOUTHWESTERN GRAPHITE
CO**

Burnet
Pres: George W Clemson
VP: Robert P Miller, Jr
VP & Gen Mgr: R P Miller, Jr
Sec-Treas: Robert P Miller, Jr
Supt: G E Hillard
Geol: D C Peacock
Elec Eng: Geo Lockwood
MINE, 11 mi NW of Burnet, surface
graphite
Mine Frm: Pete Bible
Prod: 300 tons
380-TON FLOT MILL, at mine
Mill Frm: Tom McAllister
Assay: James Wright

**SOUTHWESTERN PORTLAND
CEMENT CO**

Box 303, El Paso
MINE, Hudspeth County, gypsum

SOUTHWESTERN TALC CO

Box 583, Liano
Pres: Wm Nagley
VP & Sec: Clinton G Brown, Jr
Asst Sec & Office Mgr: Tracy Ward
MINE, Sierra Blanca, open pit,

commercial talc
Gen Mgr: J B Upton (Van Horn, Tex)
Prod: 165 tons
ROLLER MILLS, Liano
Mill Supt: Albert Fox
Cap: 180 tons of talc daily

SUNRISE MNG CO

708 Simons Bldg, Dallas, Texas
Pres: A P Simons
Res Mgr: G W Irvin
(See Ariz)

SUPERIOR INDUSTRIES, INC

308-11 Meadows Bldg, Dallas
Pres & Purch Agt: O T Ball
VP: W C Maxey
Sec-Treas: Inez Gibson
(See Ariz)

TERLINGUA MERCURY CORP

Jones Bldg or Box 330, Alpine
Pres: R N Pulliam
VP: Alexander H Cameron
Sec-Treas: J M Cameron
FRESNO, CAMP DE LOS ANGELES
MINES, Terlingua, Quick Silver
dist, undergr, Hg
Gen Mgr: R N Pulliam
Mine Frm: Jesus R Castillo
Under devel
ROTARY FURNACE, at Fresno Mine
Supt: L C Bradford

TEXAS GULF SULPHUR CO

New Gulf
Chmn of Bd: F M Nelson
Pres: C O Stephens
VP: Dr C F Fogarty
E F Van Der Stucken
E C Meagher
Purch Agt: R L Carter
BOLING MINE, New Gulf, S
MOSS BLUFF MINE, Liberty, S
SPINDLETOP MINE, Beaumont, S
undergr
Prod: 8,000 tons daily
(See N Y)

TWIN STAR INDUSTRIES, INC

1111 Congress T, Austin
Pres: W B Pratt
Exec VP & Treas: Leigh Ellis, Jr
VP, Mining: John S McNabb, Jr
VP, Sales: Warren Bosman

WAH CHANG CORP

233 Broadway, New York, N Y
TIN SMELTER, Texas City
(See Calif, Nev, NY & E A Schulz &
J H Casler, Ariz)

UTAH**ALGONQUIN MINES**

418 Olive St, St Louis, Mo
Op Part: Chas D Long
MINE, Lisbon Valley, San Juan
County, U₃O₈
Under devel

**ALHAMBRA CONSOLIDATED
MINES, INC**

1002 Outpost Dr, Hollywood 38,
Calif
400 LODE CLAIMS, Henry Mt dist,
Garfield County, U₃O₈
(See Calif, Nev)

ALTA UNITED MINES CO

Box 481, Salt Lake City
SOUTH HECLA MINE, Salt Lake
County, Ag, Pb, Zn
Idle

AMERICAN CONSOL MINES

Salt Lake City
Pres: Henry Squires
Sec-Treas: W J Robertson
Idle

AMERICAN GILSONITE CO

134 West Broadway, Salt Lake City
Pres: E F Goodner
VP: R E Nelson
Sec-Treas: E E Owen
Asst Prod Mgr: John M Baker
BONANZA MINES, Bonanza, undergr,
gilaite
Gen Supt: Paul Borden
Mine Frm: L F Williams
Mine Eng: Richard Dewey
Prod: 500 tons
200-TON MILL, Bonanza, drying
& eluting plant
(See Colo)

**AMERICAN SMELT & REFIN
CO**

700 Crandall Bldg, Salt Lake City 1
WESTERN DEPARTMENT
Gen Mgr: W G Roulard
Asst Gen Mgr: R L Hennesbach
MINING DEPT
Mgr: J F Frost
Mig Eng: Norman Weiss
SMELTING DEPT
Mgr: Kuno Doerr, Jr
Asst Mgr: R J McAllely
Asst Mgr: L K Nicholson, Jr
Ore Buyer: J H Beyer
Supply Agt: C W Fredericksen
In Chg Acid & Liquid SO₂ Dept:
R D Williams
GARFIELD COPPER SMELTER,
Garfield
Supt: R Thompson
Asst Supt: E V Hardy
Person Dir: C A Keyes
(See Ariz, Calif, Colo, Idaho, Ill,
Kans, Md, Mont, Neb, N J, N Mex,
N Y, Tex, Wash, and Federal Mng
& Smelting Co, Mo)

AMERICAN STAR MNG CO

608 Dooly Bldg, Salt Lake City
Pres: Cecil Fitch
VP: Cecil Fitch, Jr
Sec-Treas: W W Watson
AMERICAN STAR MINE, Eureka, Ag,
Au, Cu, Pb
Idle

AMPET CORP

Colorado Bldg, Denver, Colo
Pres: R A Goss Davis
Sec-Treas: Alfred O Brehmer
MINES, San Juan, Emery, Grand
Counties, U₃O₈ Prod
(See Ariz, Colo)

ANACONDA CO, THE

25 Broadway, New York 4, N Y
CARR FORD OPER: Bingham
Canyon, Pb, Zn
Explor
(See Subsidiary International Smelting
& Refining Co, Ariz, Utah, and
Anaconda Company, Calif, Idaho,
Mont, Nev, N Mex, N Y)

ANDERSON, W H

430 E 1st North, Pleasant Grove
CLOUDBURST MINE, Utah County,
Au, Ag, Pb, Cu
Idle

**ARENTEZ COMSTOCK MNG
VENTURE**

870 First Security Bldg, Salt
Lake City
Pres: Samuel S Arentz (Managing
Partner)
Treas: Frank H Anderson
(See Nev)

ATOMIC RESOURCES CORP

528 3rd NW, Albuquerque, N Mex
Pres: J V Reynolds
Treas: John R Less
WATERFALL GROUP, P O Box 458,
Monticello, Dry Valley, undergr &
open pit, U₃O₈, V₂O₅
Gen Mgr: Carl Diamant
Prod: 100 tons
100-TON FLOT MILL, Dry Valley

BALSLEY & BERRETT

Moab
Partners: H W Balsley, Ray A
Berrett

SUNFLOWER & SNOWFLAKE MINES,

San Juan County, U₃O₈
Under devel

BAR X MNG CO

155 E 2nd St, Salt Lake City
ESTHER GROUP, Tooele County,
Ag, Pb, Zn
Idle

BARROS, RICHARD

Box 504, Sunnyside
SILVER SPUR 1, Emery County,
open pit, Au, Cu
Idle

BEAR CREEK MINING CO

181 42nd St, New York 17, N Y
MINE, East Titanic dist, Au, Ag,
Cu, Pb, Zn
Under devel
(See N Y, Wash & Kennecott Copper
Corp, N Y)

BESTWALL GYPSUM CO

120 E Lancaster Ave, Ardmore, Pa
GYPSUM MINE, Sigurd
(See Iowa, Kans, Mich, N Y, Pa, Tex)

BIG HORN URANIUM CORP

c/o Keith B Redd, Monticello
Pres: Allan Egbert
VP: Morris Nelson
Sec-Treas: Frank Hammond
Gen Mgr: Keith B Redd
LOST BOY MINE, White Canyon dist,
undergr, U₃O₈
Mine Frm: Max Edgel
Idle

BINGHAM EMPIRE MNG CO

P O Box 37, 135 N University,
Provo
VP: Philip S Knight
Sec-Treas: Richard Knight
MINE, Bingham Canyon, 20 mi SW
of Salt Lake City, undergr, Cu, Pb,
Ag
Idle

BLACK BEAR CONE MNG CO

186 N Canon Dr, Beverly Hills,
Calif
Pres: Ralph S Reiner
Utah Agent: Merrill C Faux
MINE, Potts Fraction, Durkee
dist, Piute County, U₃O₈

BLAKE & NIELSON

Monticello, Utah
Partners: Donald V Blake,
Milton Nielson
GISMO MINE, White Canyon dist,
San Juan County, U₃O₈

BLUE GOOSE MNG CO

Box 1055, Farmington, N Mex
LUCKY LADY CLAIMS, Circle
Cliffs area, Garfield County, U₃O₈
Idle

BLUE LIZARD MINES, INC

36 W Broadway, Salt Lake City
Sec-Treas: B Leland Tanner
BLUE LIZARD MINE, Red Canyon
dist, San Juan County, U₃O₈

BONNEVILLE, LTD

540 W 7th South St, Salt Lake City 4
Chmn of Bd: W L Bradley
Pres: L W Ferris
Sec: G B C Mathison
Treas: Robert Livermore
Purch Agt: W R Thomas
MINE, Wendover, KCl
1,000-TON FLOT MILL
Gen Mgr: L W Ferris
Gen Supt: Jesse V Ecton
Asst Supt & Mill Frm: J Rands Wiley
Met: D C Hunter
Chemists: Clyde Andrew, Hal C
Ballard

BOYLES BROS DRILLING CO

1321 S Main St, Salt Lake City
Pres: R T Goldsworthy
VP: H L Baker
Sec: A F Goldsworthy
Treas: W L Stevens
Purch Agt: A P Tackher
Comptroller: E D Haddon

BRISTOL SILVER MINES CO

218 Felt Bldg, Salt Lake City 1
Pres: George W Snyder
VP: Edward H Snyder
Sec-Treas: C M Christensen
(See Nev)

**BRITISH WESTERN AMERICA
URANIUM CORP**

821 1st Security Bank Bldg,
Salt Lake City
Pres: Henry Kyle
VP: George Barnes
Sec: I C Scott
(See Colo)

BULLION MONARCH MNG CO

Idaho Falls, Idaho
Or c/o VANADIUM CORP OF
AMERICA, 430 Lexington,
New York 17, N Y
FARMER JOHN MINE, Marysville
dist, Piute County, U₃O₈
(Leased to VCA)

CALERA MNG CO

(Subsidiary of HOWE SOUND CO)
238 N 21st West, Salt Lake City
Pres: E C Roper
VP: W M Fassell, Jr
Treas: W T Holmes
Purch Agt: J W Farnsworth
CHEM REDUC PLANT, Garfield
County, Cobalt
Supt: J S Mitchell
Prod Supt: W A McIntyre
(See Idaho & Howe Sound Co, Ida, Utah)

CAPITAL-SEABOARD CORP
Box 1847, Farmington, N Mex
Pres: Joseph H Corbin
Exec VP & Gen Mgr: Chas W Yetter
Sec: Wm A Pope, Jr
Treas: Howard L Corbin
TAYLOR REID #1, 2, Ojito,
San Juan County, undergr, U₃O₈,
V₂O₅
Mine Supt: James Donini
Prod: 15 tons
(See Ariz, Idaho, Mont, N Mex, Tex)

CAPITOL URANIUM CO
Box 1847, Farmington, N Mex
Pres: Warren E Wiley
VP: Fred Carson
Sec-Treas: William A Pope, Jr
TAYLOR REID NO 1 MINE, Ojito,
undergr, U₃O₈, V₂O₅
Mine Supt: Marshall J Fletcher
Idle
(See Ariz, N Mex)

CARDIFF MNG & MLO CO
Box 9008, Denver 16, Colo
CARDIFF MNE, Salt Lake County,
undergr, Ag, Pb, Zn
Gen Mgr: A J Wondershak
Geol: Gerald Fairchild
Under devel

CARISA MINING CO
P O Box 107, Marysville
CARISA MNE, undergr, Au, Ag,
Pb, Cu
Own: Lucy Dehake
Under devel

CENTENNIAL DEVEL CO
Eureka
Pres: Harold B Spencer
VP: James Quigley
Sec-Treas: Robert E Watt
Ofc Mgr: Frank McCabe
Fld Eng: E Steele McIntyre

CHIEF CONSOL MNG CO
606 Dooly Bldg, Salt Lake City
Pres & Gen Mgr: Cecil Fitch, Jr
VP & Sec-Treas: W W Watson
CHIEF NO 1, EAGLE, BLUE BELL,
PLUTUS MINES, Eureka, undergr,
Zn, Pb, Ag, Au
Idle

CHRISTINE MINES
Muzb
Pres: Chris D Vye
HUMBURG MNE, East Canyon dist,
San Juan County, U₃O₈
Under devel - some production

CLIFF DEVEL & EXPLOR
CORP
4643 Hyland Dr, Salt Lake City
Pres & Gen Mgr: W C Dunham
VP: Deloy Tanner
Sec-Treas: Doris T Dunham
SHOWERS MNE, Silver City,
undergr, Cu, Pb, Zn
Under devel

CLIMAX URANIUM CO
P O Box 1901, Grand Junction, Colo
Pres: Frank Coolbaugh
VP-Gen Mgr: A M Mastorovich
Consultant-Dtr: E J Duggan
Mgr of Mines: L J Brewer
Ch Geol: Philip Donnerstag
Asst Treas: A R Eikenberry
Asst Sec: T E Congdon
PROFIT MNE, Monticello dist,
San Juan County
MINERAL POLAR #22, CACTUS RAY,
CANE CREEK, Grand County, Utah
U₃O₈ prod & development
(See Ariz, Colo, N Y)

COG MINERALS CORP
Denver Club Bldg, Denver, Colo
Pres: W C Norman
VP: J H Hanson
Treas: D F Taylor
Purch Agt: Ed McDonald
SPOOK BULLSEYE & BASIN MINES,
Blanding dist, undergr, U₃O₈, Cu
Gen Mgr: Ross V Seaton, Jr
Geol: Clare Gregg
Mine Supt: S K Bradford
Mine Perm: Homer Taylor
Mine Eng: Skip Moore
Prod: 140 tons
100-TON UPGRADE CONCEN MILL,
Fry Canyon

Mgr Mlg Div: Frank A Seaton
Mill Supt: Homer Dale
Mill Perm: James Schulenberg
Assay: William Rhodes

COLORADO CONSOL MINES
CO
1114 Walker Bank Bldg, Salt Lake
City
Pres: H E Raddatz
VP: Harriet D Travis
Sec: Glen Hardy
Gen Mgr: M D Paine
COLORADO CONSOLIDATED MNE,
(Leases) Dividend, 2 mi SE of
Eureka, undergr, Pb, Au, Ag, Cu

COLORADO FUEL & IRON
CORP
Cedar City
BLOWOUT & COMSTOCK MINES,
Iron Mt, surface, Fe
Res Eng: John Robertson, Jr
Prod: 4,000 tons
(See Colo, Wyo)

COLUMBIA IRON MNG CO
(Subsld U S STEEL CORP)
120 Montgomery St, San Francisco,
Calif
Pres: L B Worthington
Exec VP: L J Westhaver
VP-Oper: J D McCall
Sec: D J McDaniel
Mgr, Raw Mat Devel: R C Talbot
Ch Eng: W F Proden
Dir, Ind Rel & Safety: C T Spivey
Dir of Purch: H W Christensen
MINES, Iron Mt & Desert Mount
20 mi W of Cedar City, surface, Fe
Gen Supt: G D MacDonald
Mine Eng: J D Quinn
CRUSHING & SCREENING PLANTS,
Desert Mount & Iron Mt
(See U S Steel, Alaska, Ala, Calif,
Ky, Miss, Pa, Tenn, Utah, Wyo)

COMBINED METALS
REDUCTION CO
Box 150, Salt Lake City 10
Pres & Gen Mgr: E H Snyder
VP: E H Snyder, Jr
VP Eng: W H Kelasey
Treas: O F Burton
Sec: C M Christensen
Purch Agt: E G Black
Gen Mgr: Paul Gemmill
Ch Chem: H F Hansen
Research Met: Corwin Likens
Mech Eng: A L Schindler
Ch Elec Eng: John M Ridges
BAUER PLANT OPS: Stockton,
Pb, Zn
Gen Supt: L C Droubay
Mine Supt: O D Cameron
Mill Supt: Winford Hector
Met: Rex Hayes
Master Mech: Kenneth Shields
Offic Mgr: Frank Andrews
1200-TON FLOT MILL
Assayer: Kay Hanson
RESH REFINERY
(See Nev)

COMMONWEALTH LEAD MNG
CO
444 W Center St, Provo
Pres: Orvil J Coit
VP: Royal B Garff
Sec-Treas & Gen Mgr: Dean R
Featherstone
Geol: Joseph W Hewitt, Jr
OPHIR MNE, Stockton
Eber Manti

COMMONWEALTH MNG CO
OF S D
Box 892, Sioux Falls, S D
COMMONWEALTH URANIUM NO 1
& 2, near Greenriver & near Kanab,
undergr, U₃O₈
Gen Mgr: Elway O Ferguson
Idle
(See S D)

COMSTOCK URANIUM & OIL
CORP
211 Phillips Petroleum Bldg,
Salt Lake City
Pres: S A Walsh
VP: Wm A Saari
Sec-Treas: L K Nicholson, Jr
Cons Geol: J J Beeson
(See Nev)

CONSOL EUREKA MNG CO
217 Kearns Bldg, Salt Lake City 1
Pres: James E Hogle
VP: J C Johnson
Sec-Treas: L J Lerwill
Gen Mgr & Purch Agt: Sherman B
Kinckley
(See Nev)

CONTINENTAL MATERIALS
CORP (Formerly CONTINENTAL
URANIUM, INC)
P O Box 1550, Grand Junction, Colo
Pres: Willard Gidwitz
Sec: Max H Braun
Bd Chmn: Gerald Gidwitz
CONTINENTAL NO 1, LaSal, undergr,
U₃O₈, V₂O₅
Gen Supt: C H Reynolds
Geol: H M Smithson, Gerald Brooke
Met: James C Ternaba, Jr
Mine Supt: Clarence O Cox
Prod: 100 tons
(See Colo, Wyo & Woodmont, Inc, Utah)

COPPER CANON MINING CO
Box 307, Farmington, N Mex
Treas: W G Manwarren
Utah Agts: Senior & Senior, 19 Each
Place, Salt Lake City
MITTEN NO 1 & MITTEN NO C-3
MINES, San Juan County
U₃O₈ Prod

CULLEN MINERALS CORP
810 Rood Ave, Grand Junction,
Colo
Pres: Lucien H Cullen
VP: K D Kaasch
Sec-Treas: T M Tucker
ELIZABETH & FRISCO MINES,
Box 585, Monticello, undergr,
U₃O₈, V₂O₅
Gen Mgr: K D Kaasch
Asst Gen Mgr: L G Peterson
Gen Supt: Fred Zanetti
Mine Supt: Paul Alex
Prod: 20 tons (Elizabeth)
40 tons (Frisco)
(See Colo)

CULLEN-CAMPBELL IRON
MINING CO
c/o Trust Dept, Continental Bank
& Trust Co, Salt Lake City
Trust Officer: W L O'Meara
CULLEN CAMPBELL IRON MNE,
Iron Springs dist, Iron County

CUPRIC MINES CO
29 Exchange Place, Room 29,
Salt Lake City 11
Sec-Treas: David H Bullough
NEWHOUSE-CACTUS MNE, San
Francisco dist, Beaver County,
open pit development, Cu

CURTIS URANIUM MINES
625 N 7th W, Provo
Own: M E Curtis
6 CLAIMS, SE of Circo, undergr,
open pit, U₃O₈, V₂O₅
Idle

DRAGON CONSOL MNG CO
c/o Rom Warburton, 818 Kearns
Bldg, Salt Lake City
Pres: J Will Knight
VP: J J Lillie
Sec: Rom Warburton
Geol: M E Kildale
Purch Agt: T K Davis
DRAGON MNE, 4 mi S of Eureka,
undergr & surface, halloysite clay,
As
(Lessee: Filtrrol, Inc, Salt Lake City)

EAGLE & BLUE BELL MNG
CO
608 Dooly Bldg, Salt Lake City
Pres: Robert E Watt
Sec-Treas: Audrey L Christenson
EAGLE & BLUE BELL MINES, Juab
County, Au, Ag, Cu, Pb, Zn
Idle

EAST UTAH MINING CO
Dry Valley
BLUE ROCK MNE, 20 mi NE of
Pleasant Grove, undergr, Ag, Pb, Au

EL DORADO MNG CO
818 Newhouse Bldg, Salt Lake City
Pres & Gen Mgr: Whitney C Hanson
VP: Sherman Jensen

Sec: Alvin G Pack
Treas: Ivin O Nichols
CLAIMS, North Bingham, Indian
Creek, San Juan County & Nodum
Bench, Garfield County, undergr,
U₃O₈
Under devel
EL DORADO MNE, Salt Lake County,
undergr, Ag, Au, Pb, Zn
Geol: H E Havenor
Supt: George Rhodes
Idle

EL OPAL MNG
Box 1109, Moab
Pres: Donald F Lenox
VP: Floyd Lenox
Sec: Mrs D F Lenox
YELLOW CIRCLE NO 151 MNE,
undergr, U₃O₈, V₂O₅
Mine Perm: Shorty Begvey
Prod: 12 tons
BEEF BASIN GROUP
Under devel

EMPIRE MINES CO
818 Kearns Bldg, Salt Lake City
SPY & BLACK JACK MINES, Juab
County, Au, Ag, Cu

EUREKA LILLY CONS MNG
CO
1114 Walker Bank Bldg, Salt
Lake City 1
Pres: H E Raddatz
VP: Harriet D Travis
Sec: Glen Hardy
Gen Mgr: M D Paine
EUREKA LILLY MNE, Dividend,
undergr, Au, Ag, Cu, Pb
Idle

EUREKA STANDARD CONSOL
MNG CO
1114 Walker Bank Bldg,
Salt Lake City
Pres: H E Raddatz
VP: Harriet D Travis
Sec: Glen Hardy
Treas-Purch Agt: M D Paine
EUREKA STANDARD & DUMP
MINES, Utah County, Au
Idle

EVEN ODDS, INC
Box 12, Monticello
Pres: James L Menlove
VP: Bonnie L Dalton
Sec: Melvin K Dal ton
Treas: Joan D Menlove
PETE & LEE MINES, undergr,
U₃O₈, V₂O₅
Gen Mgr: Carl Mahon
Prod: 25 tons

EXCALIBUR URANIUM CORP
Box 1201, Santa Fe, New Mexico
Treas: Zane E Henderson
COTTONWOOD #6 MNE, Green
River dist, Emery County, U₃O₈
Under devel

FAIRWAY URANIUM CORP
2320 S Main St, Salt Lake City
Pres & Gen Mgr: O C Larson
Sec: Kenneth Taylor
(See Idaho)

FEDERAL URANIUM CORP
P O Box 1317, 248 S Main St,
Salt Lake City
Pres: R W Neyman
VP: Lester S Harrison
Sec-Treas: C Allen Elggrén
Purch Agt: Grant F McGowan
VARIOUS MINES, U₃O₈, Ag, Pb,
Zn, Cu
Gen Supt: Lee Messerly
Geol: Raymond Lindolf
Met: Arthur Griffiths
Mech Eng: Joe V MacGuffie
(See N Mex)

FISHER, O L & ASSOCIATES
P O Box 82, Morgan St, Modena
Lessee-Op: O L Bill Fisher
THE OPHIR MINE, Modena, 21 mi
N at Old State Line dist, undergr,
U₃O₈, Au, Ag, CaF₂
Under devel

FIVE STATES URANIUM CO
Simms Bldg, Albuquerque, N Mex
DIRTY DEVIL CLAIM, Emery
County, U₂O₈
CLAIMS, Tomisch Mountain, Emery
County, U₂O₈
Idle

**FOUR CORNERS URANIUM
CORP**
P O Box 1749, Grand Junction
VP: Edward L Clark
GREEN RIVER GROUP (9 MINES)
Green River, U₂O₈
Gen Mgr: W R Bronson, Monticello,
(See Colo, Wyo)

**FRISCO SILVER LEAD MNG
CO**
39 Exchange Place, Salt Lake City
Pres: Paul H Hunt
Sec: David H Bullough
MINE, 25 mi W of Milford, undergr
Idle

**GARFIELD CHEMICAL &
MFG CORP**
700 Crandall Bldg, Salt Lake City
Pres: Kuno Doerr, Jr
VP: L F Pett, F C Green
Sec-Treas: L K Nicholson, Jr
Purch Agt: C W Fredericksen
1,000-TON SULPHURIC ACID PLANT
Garfield
Mgr, Acid & Liquid SO₂ Dept:
R D Williams
Supt: A S Neulen

GERONIMO URANIUM MNG
345 S State St, Salt Lake City
(See Calif)

GLENNY-CUTLER
704 Newhouse Bldg, Salt Lake City
MINES, Various operations in San
Rafael and Temple Mtn districts,
Emery County, U₂O₈

GOLDEN CYCLE CORP, THE
P O Box 86, Carlton Bldg,
Colorado Springs, Colo
MINE, Marysville
Supt: Maurice Castagne
(See Colo)

GRAMMICH EXPLOR CO
Box 435, Moab
Pres & Gen Mgr: J W Grammich, Sr
VP & Asst Gen Mgr: J W Grammich, Jr
Sec-Treas & Gen Supt: Philip F
Grammich
BLUE JAY & SAN JUAN MINES,
undergr, U₂O₈, V₂O₅
Geol: Don Ebbly
Mine Eng: Hub Newell

GRAND DEPOSIT MNG CO
409 Ness Bldg, Salt Lake City
Pres: Paul C Lyon
VP: Walter J Eldridge
Sec & Gen Supt: Paul C Lyon, Jr
(See Nev)

GREAT FRONTIER MNG CO
647 Glenwood Ave, Grand Junction,
Colo
Mgr: S P Clayborn
CEDAR POINT MINE, Gateway dist,
Grand County
U₂O₈ Prod

GREAT WESTERN MINES CO
P O Box 37, Provo
Pres & Gen Mgr: Richard Knight
VP: W S Brimhall
Sec-Treas: Philip S Knight
46 CLAIMS, Snake Creek dist,
American Fork Mng dist, undergr,
Cu, Au, Ag, Pb
(Under lease to New Park Mng Co)
Under devel

**GREEN HORN SILVER MNG
CO**
P O Box 107, Marysville
Own: Louis C Deluke
MINE, Marysville, undergr, Pb,
Zn, Au, Ag, Cu
Idle

**GREEN RIVER OIL &
URANIUM CO**
26 W Broadway, Salt Lake City
Pres: Falias M Kelly
Sec-Treas: Austin B Smith
(See Colo, Wyo)

**HALDANE & JONSON MNG
CO**
1037 Ouray Ave, Grand Junction,
Colo
Partners: W E Haldane, O E Jonson
PROFIT MINE, East Canyon, San
Juan County, undergr, U₂O₈, V₂O₅

HALL, BAILEY & NIELSON
Monticello,
Partners: E J Hall, E R Bailey, Jr,
Milton Nielson
MAYBE MINE, WHITE CANYON MNE,
San Juan County,
U₂O₈ Prod

HAMILTON, TANNER & LOHSE
Box 885, Kirtland, N Mex
Pres: Gene Hamilton
VP & Purch Agt: Lynn C Tanner
Sec: Vernon Lohse
JASPER & AGATE MINES, Fry Canyon,
undergr, U₂O₈, Cu
Geol: A C Tangreen
Under devel

HAMPTON MNG CO
c/o Stanford R Mahoney,
503 Atlas Bldg, Salt Lake City
SILVER EAGLE MINE, Tooele
County, Ag, Pb, Zn
Idle

HARRINGTON MINES CO
c/o Jack Hanley, Jr, Milford
HARRINGTON-HICKORY GROUP,
Ag, Pb, Zn
Idle

HECLA MNG CO
Moab
Pres: L J Randall
Mgr of Mines: W H Love
RAIDON MINE, Big Indian dist,
near Moab, undergr, U₂O₈
Mine Supt: Philip Lindstrom
Mine Frm: Grant Eslick
Mine Eng: Vernon Davis
Prod: 255 tons
(See Idaho)

**HIDDEN RAINBOW URANIUM
CO**
3941 L A Hi-way, Las Vegas, Nev
Gen Mgr & Own: Joseph A LaBarber
MINE, Emery County, undergr
Asst Gen Mgr: James Gordon
Geol: Francis Frederick
Met: Merrill MacAfee
Mine Supt: James Gordon
Mine Frm: Wells Noyes
Under devel

**HIDDEN SPLENDOR MNG CO,
THE**
First Security Bldg, Salt Lake City
Pres: A Payne Kibbe
VP & Gen Mgr: Dale I Hayes
VP: David A Stretch
Sec-Treas: Edward R Farley, Jr
Purch Agt: Jack E Hopfenbeck
Gen Cons Eng: Otto D Rohlf, Jr
Gen Supt: Kenneth A Nobs
Asst Gen Supt: Ray L Schultze
Ch Geol: William B Loring
Ch Eng: E T Wood
DELTA MINE, Muddy River, Emery
County, undergr, U₂O₈
Idle

FAR WEST, Big Indian Wash, San
Juan County, undergr, U₂O₈
Mine Supt: John R Mullen
Mine Frm: Albert P Edwards
Prod: 15,000 tons
COLUMBA SHAFT, undergr, U₂O₈
Mine Supt: Harry S Poller
Prod: 2,500 tons
EKE SHAFT, undergr, U₂O₈
Mine Frm: Lynn D Barry
Prod: 3,700 tons
(Subsidiary of Atlas Corp)

**HOMESTAKE MNG CO,
UTAH DIV**
100 Bush St, San Francisco, Calif
NORTH ALICE MINE, Big Indian

dist, San Juan County, undergr, U₂O₈
Gen Supt: Gordon M Miner
Asst Supt of Mines: Edw F Jacobson
Mine Frm: Jefferson Taylor
Eng: Walt Weid
(See Calif, N Mex, S D, Wyo)

HORN SILVER MINES CO
39 Exchange Place, Salt Lake City
Pres: P H Hunt
Sec-Treas: D H Bullough
HORN SILVER MINE, Milford, Av,
Ag, Pb, Zn
Idle

**HORSETHIEF CANYON
URANIUM INC**
930 E 3rd S, Salt Lake City
Pres: Chester M F Peters
VP: James L Knowlden
Sec: Jessie M Peters
Treas: Eugene Moeuch
HORSETHIEF CANYON MNE,
Green River area, undergr, U₂O₈,
V₂O₅
Gen Mgr: C M F Peters
Idle

HOWE SOUND COMPANY
238 North 21st West, Salt Lake
City 16
Pres: E C Roper
VP: W M Passell, Jr
Treas: W L Holmes
Purch Agt: J W Farnsworth
(See Idaho & Calera Mng Co, Idaho,
Utah)

HUNT, KAY
Kankaville
KING GROUP, undergr, open pit,
U₂O₈
Prod: 5 tons
BLUE BIRD GROUP, undergr, open
pit
Mine Frm: Raymond C Harvey
Prod: 10 tons

HUNT OIL CO
Grand Junction, Colo
DRILLING, La Sal Creek, U₂O₈
Under devel
THORNBURG LEASE, U₂O₈
Idle
(See Colo)

HUNT URANIUM CORP
Hanksville
Pres: Andrew Hunt
VP & Gen Mgr: Kay Hunt
Sec & Geol: Rio Hunt
Treas & Asst Mine Supt: Loyd Hunt
POISON SPRINGS MINE, undergr,
U₂O₈, Cu
Idle
(See Colo)

**HYPOTHEEK MNG & MFG
CO**
510 Bank St, Wallace, Idaho
CLAIMS, U₂O₈
Idle
(See Idaho, Mont)

IBEX GOLD MINING CO
135 N University Ave, Box 27,
Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
IBEX MINE, (Leased), near Delta,
in Drum Mt dist, undergr, Cu, Au,
Ag
Idle

INDEX-DALEY MINES CO
118 N Main St, Salt Lake City
Pres & Gen Mgr: Charles S Woodward
VP: Glen A Finlayson
Sec-Treas: R W Edmonds
(See Nev)

**INDIAN CREEK URANIUM
& OIL CORP**
2320 S Main St, Salt Lake City
Pres: O C Larson
VP: Kenneth Taylor
Sec: Preston W Frame
Treas: D W Richards, Jr
Purch Agt: O C Larson
BONANZA-CUTLER MINE,
Monticello, undergr, U₂O₈

Gen Mgr: O C Larson
Supt: L W Reiter
Geol: Geo B Fullilove
Idle

INDUSTRIAL URANIUM CO
273 So Main, Salt Lake City
VP: Robert M Schubach
VP in Chg of Oper: Robert G Harding
Sec-Treas: Wilford M Burton
**MOONLIGHT, STARLIGHT & SUN-
LIGHT MINES**, P O Box 428, Mexican
Hat, undergr, U₂O₈, V₂O₅, Cu
Asst Gen Mgr: C R Ranney
Gen Supt: John Borkert
Prod: 300 tons

INDUSTRIES & MINES INC
85 Broad St, New York 4, N Y
**DEL MONTE, DAISY JEN, CON-
GRESS, EAGLES & CHIEF MINES**,
Henry Mts, undergr & surface,
U₂O₈, V₂O₅, Au, Cu, Ta
Gen Mgr: James M Knapp
Asst Gen Mgr: Edward Honaka
Geol: Stuart St Clair
Mech Eng: Wes Kessen
Prod: 1,500 tons & developing
(See N Y)

**INTERNAT'L SMELTING &
REFINING CO**
Kearns Bldg, Salt Lake City
Ch Geol: M B Kildale
Purch Agt: T K Davis
Cashier: Norm Warburton
Traffic Mgr: Marvin J Mortensen
Counsel: Robert G Dwyer
Ore Buyer: Glen A Burt
Mgr, Tooele Pl Oper: W J McKenna
Gen Supt: E W Steinbach
Personnel & Safety: T K Voyser
Ch Elec: Harry Gillespie

INSPIRATION LEAD CO, INC
P O Box 179, W 909 Sprague Ave,
Spokane 10, Wash
PROPERTIES, Brumley Ridge, E of
Moab, Grand County, U₂O₈
CLAIMS, W of Blanding, Big Indian
dist, San Juan County, U₂O₈
Explor
(See Idaho)

ISBELL CONST CO
Box 2351, Reno, Nev
HAPPY JACK URANIUM MINE,
Fry Canyon, contract mng for Texas-
Zinc Minerals Corp
Supt: Dick Strand
(See Ariz, Idaho, Nev, Wash)

JEN, INC
Moab
Chmn of Bd: E H Seyder
Pres: C E Tuttle
VP: E H Seyder, Jr
Sec-Treas: C M Christenson
Mine Mgr: George Teal
MINE, E L Cord Properties, Big
Indian dist, San Juan County
U₂O₈ Prod

JOINT VENTURES EXPLOR
P O Box 42, Moab
Own: M Smith, K Allred, W Shupe
Sec-Treas: Marlowe Smith
AT LAST MINE, undergr, open pit,
U₂O₈
Prod: 6 tons

JOLLY JACK URANIUM
623 Judge Bldg, Salt Lake City
PROPERTIES, White Canyon area,
Big Indian dist & Garfield County,
U₂O₈
Mine Supt: Vernon R Ailman

**KENNECOTT COPPER CORP,
UTAH COPPER DIV**
P O Box 1650, Salt Lake City 13
Gen Mgr, Utah Copper Div: L F Pett
Asst Gen Mgr, Utah Copper Div:
F C Green
Gen Supt of Oper, Utah Copper Div:
J C Landenberg
Dir, Indus Rel: E C Simkins
Dir, Communications: D C Houston
Dir, Safety & Fire Control:
E K Olson
Dir, Pub Rel: H W Aldrich

Dev Comptroller: J P O'Keefe
Asst Div Compt: O C Madsen
Ch Eng: A J Thall, Jr
Ch Mine Acct: S W Jacques
Ch Mill Acct: C R Brooks
Storekeeper: Mill: G H Kavanagh
Storekeeper: Mine: A J Boberg
Ch Refinery Acct: H L Erickson
Ch Eng Ref: R P Anderson
Master Mech: Mine: S A Gudmundsen
Gen Master Mech: Mills: L Baldee
Master Mech: Magna: W L Hewick
Master Mech: Arthur: J W Ledingham
Traffic Mgr: A L Pratt
CENTRAL POWER STATION, Garfield
Ch Eng: J H Narhine
MILLS ORE HAULAGE, Garfield
Supt: L S Hills
BINGHAM MINE, Bingham Canyon, Cu
Mine Supt: V S Barlow
Asst Mine Supt: J A Horden, Jr
Ray F Gough
Employment Dir: L O Hamlin
Safety Eng: Ross Pico
MAGNA & ARTHUR MILLS, Garfield
Gen Supt: P H Ensign
Supt: Magna: T J Hubbard
Supt: Arthur: C G Quigley
Asst Supt: Magna: T J Barker, Jr
Employment Dir: M A Moffat
Ch Elec Eng: R J Corfield
Safety Eng: R L Erickson
Ch Met Eng: A G Johnson
Ch Anal Chem: V A Fraser
UTAH REFINERY, Garfield
Supt: H A Shaw
Asst Supt: E H Koropp
Met Eng: C A Zeldin
Plant Elec: I G Salisbury
Master Mech: R F Johnson
GARFIELD WATER & IMPROVEMENT CO, Garfield
Supt: C R Naylor
 (See Ariz, Nev, N Mex, N Y & Bear Creek Mng, Utah)

KENO MNG & MFG CO
 185 N University Ave, Box 37
 Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
IBEX MINE (Leased), Detroit Mng
 dist, north end of Mineral Mt range,
 undergr, Ag, Pb
 Idle

KERN COUNTY LAND CO
 Newhouse Bldg, Salt Lake City
Pres: George Montgomery
VP, Oil & Minerals: H L Reid
Ch Geol: Wm Griswold
 Explorer
 (See Calif)

KNAPP URANIUM DEVEL
 855 E 5600 S, Salt Lake City
Pres: Clyde J Knapp
 (Mines leased out)

LAKESIDE-VANURA JOINT VENTURE
 Marshall Court, Moab
Agt: Ellie R Cook, Jr
ALLEN #2 MINE, Approx 70 mi W of Blanding, undergr, U₃O₈, V₂O₅, Cu
Gen Supt: Everett Blackburn
Lessee: Virgil Allen
Prod: 20 tons
 Under devel

LA SAL MNG & DEVEL CO
 Box 563, Moab
LA SAL MINE, Big Indian dist, San Juan County, undergr, U₃O₈
Supt: Gordon Miner
Frns: Donald Waterman
Mine Eng: Walt Weid
Prod: 215 tons

LA SHUBERCO MNG CO
 Box 303, Marshfield, Wis
Pres: Grant Johnson
VP: W W Mittelstadt
Sec: Fred Wolf
Treas: Dan Hoek

LITTLE EVA MINE, Yellow Cat dist, Grand County, undergr, U₃O₈, V₂O₅

LEWIS, E E & ASSOCIATES
 Box 1649, Grand Junction, Colo
Agent: O M Duckett

BLACK STONE MINE, Yellow Cat dist, Grand County, U₃O₈
 Under devel - some production

LISBON URANIUM CORP
 304 First Security Bldg, Salt Lake City
Pres: A P Kibbe
VP: Eric C Ryberg
Sec: Max B Lewis
Treas: Glen L Davis
IRE & NIXON CLAIMS, Big Indian dist, U₃O₈
JULY LEE & PATTI ANN CLAIMS, 1 mi N of Ike & Nixon Claims, U₃O₈
Geol: Harold W Blakely
 (See Mont, Colo, Wyo, N Mex)

LISBON VALLEY URANIUM CORP
 501 Kittredge Bldg, Denver, Colo
MASSEY & "C" GROUP MINES, Colorado-River area, San Juan County, U₃O₈

LITTLE BEAVER MNG CO, INC
 Box 583, Moab
Pres: Donald H McLaughlin
LITTLE BEAVER MINE, Big Indian dist, San Juan County, undergr, U₃O₈
Gen Mgr & Mine Supt: G M Miner
Asst Mine Supt: Edw F Jacobson, Jr
Frns: Frank Bezie
Mine Eng: Walt Weid
Prod: 100 tons

LONE STAR MINING & DEVELOPMENT CORP
 235 Korber Bldg, Albuquerque, New Mexico
Pres: W L Davidson
BUTLER WASH & JACKPOT MINES, Monticello dist, San Juan County
NORTH WASH #1, Henry Mtn dist, Garfield County, U₃O₈, V₂O₅
Prod: 20 tons
 (See N Mex)

MAGNUS INTERNATIONAL CORP (Formerly Malco Explor Co, Inc)
 P O Box 266, Los Alamos, N Mex
MAGNUS NO 1 & 2, Castle Dale, undergr, U₃O₈
Mine Frns: A F Pritchett
Prod: 20 tons
OTHER PROPERTIES
BIG INDIAN WASH, San Juan County
SAN RAFAEL SWELL, Emery County (See Colo, N Mex)

MAMMOTH MNG CO
 Mammoth
Mgr: E S McIntyre
MAMMOTH MINE, Tintic dist, Juab County, Au, Ag, Cu, Pb

MARCY-SHENANDOAH CORP
 Jarvis Bldg, Durango, Colo
Pres: S Stokes Tomlin, Jr
VP & Geol: E M Barge
Sec: R M Schell
Treas: Robert R Snodgrass
Purch Agt: Edwin A Larson
NOTCH NO 4 MINE, W of Blanding, undergr, U₃O₈
Gen Mgr: W G Sandell
Ch Eng: Irwin I Andrews
Mine Supt: Maurice Helquist
Asst Mine Supt: Phil Hawkins
Prod: 15 tons
 (See Ariz, Colo)

MASCOT MINES, INC
 Box 969, Kellogg, Idaho
Pres: Malcolm C Brown
VP & Purch Agt: Cushman Bell
Sec-Treas: H F Magnuson
COLORADO RIVER MINE, Box 985, Moab, Hatch Point, San Juan County, undergr, U₃O₈
Gen Mgr: Claude Nugent
Mine Supt: Inar Norgaard
 Idle
 (See Idaho)

McFARLAND & HULLINGER
 Box 238, Tooele
Partners: F G McFarland, S R Hullinger

OPHIR UNIT, Tooele County, Zn
MAYBE MINE, White Canyon dist, San Juan County, U₃O₈
 (See Ariz)

MEDICINE BOW URANIUM CO, INC
 2124 S 20th East, Salt Lake City 6
Pres & Gen Mgr: J B Ferre
VP: James B Potter
Sec-Treas: Lionel J Bradford
 (See Wyo)

METAL QUEEN MNG CORP
 c/o E C Berry, Box 804
 Grantsville
Pres: E C Berry
VP: C D Bennett
Sec: S B Hagen
METAL QUEEN GROUP, Tooele County, Au, Pb, Zn, Hg
Geol: N B Crawford
 Under devel

MICHIGAN UTAH CONSOL MINES CO
 417 Beason Bldg, Salt Lake City 1
Pres: De Witt Van Evers
Sec-Treas: Rynier Van Evers

MID CONTINENT URANIUM
 204 Uranium Center Bldg, Grand Junction, Colo
JOHN INCLINE MINE, Thompson, Yellow Cat dist, Grand County, U₃O₈, V₂O₅ (Leased to Lemwood H Wilkerson, P O Box 3, Thompson)
Prod: 5 tons
 (See Colo, N Mex)

MINERAL MNG CO, INC
 Box 261, Blanding
CHANNEL MINE, Red Canyon, White Canyon dist, San Juan County, undergr, U₃O₈, Cu
Gen Mgr & Supt: Bill Franklin
Asst Mgr & Supt: Clarke P Yauger
Geol & Eng: Wm H Greever
Treas: Robert Skaggs
Prod: 100 to 200 tons
RED BOX MINE, Ferrisville, Fry Canyon, U₃O₈, Cu
 Idle
Gen Mgr: Kenneth L Fransen
Supt: Willard Edwards
Eng: Wm H Greever

MINERALS ENGR CO
 801 4th Ave, Grand Junction, Colo
CHEM REFINERY, Salt Lake City
Mgr: Blair T Burwell
Output: 2,760,000 lbs yrlr
 (See Colo, Mont)

MOAB DRILLING CO
 52 E Central St, Moab
Pres: Charles Steen
Gen Mgr: William H Lewis
DIAMOND DRILLING

MOKI MINING CO
 Phillips Petroleum Bldg, Salt Lake City
Agent: Henry H Kyle
MOKI NO 1 & MOKE NO 2 MINES, Monticello dist, San Juan County, U₃O₈

MONOGRAM URANIUM & OIL CO
 808 Petroleum Bldg, Grand Junction, Colo
Pres: Ray Baxter
VP-Sec & Treas: Howard

MONOGRAM URANIUM & OIL CO
 205 Petroleum Bldg, Grand Junction, Colo
Pres: Ray Baxter
VP: Howard F Carr
Sec-Treas: Geo Dilla
DESERT MOON MINE, Green River, undergr, U₃O₈, V₂O₅
Mine Supt: Joseph N Trudgeson
Prod: 35 tons
 (See Colo)

MONTE CRISTO URANIUM CORP
 1101 Continental Bank Bldg,

Salt Lake City
Pres & Treas: Richard Minasian
VP: Desmond Nelson
Sec: Clarence C Nealen
MONEY BEE 1 & 2 MINES, Cane Springs Canyon, San Juan County, undergr, U₃O₈, V₂O₅
 (Oper under lease by the Skidmore Mag Co of Dolores, Colo)

MOUNTAIN MINERALS INVEST CO
 Congress Hotel, 2nd S & State, Salt Lake City
Pres: Donald Gilman
VP: Richard Hunt
Sec-Treas: Marie K Reeves
POCO BUENO MINE & HIDDEN TREASURE, Tooele County, Ag, Pb, Zn, Au, Cu
Mine Supt: George Patrick
Prod: 30 tons
30-TON GRAY MILL, Gold Hill Mill Supt: Luman Gilman

MOUNTAIN VIEW MNG CO
 818 Kearns Bldg, Salt Lake City 1
MT VIEW GROUP (MAY DAY & HUMBUG), Au, Ag, Cu, Pb, Zn

NATIONAL LEAD CO, INC (Member of Nuclear Metals Div of NATIONAL LEAD COMPANY)
 Monticello
Gen Mgr: Brower Dellinger
AEC MILL, Monticello
Gen Supt: G K Coates
Plant Supt: J R Galbraith, Jr
Sampling Plant Supt: R H Pearson
Safety Eng: J E Bailey
Ch Metal: E D Dickerman
Ch Eng: H R Sanders
Ind Rel Asst: W F Carman
Comptroller: G L Holt
Purch Agent: S L Mayne
 (See Col & National Lead Co, N Y)

NATIONAL URANIUM CORP
 29 Broadway, New York 6, N Y
Pres: Thomas J Danabey, Jr
EAGLE MINE, Henry Mountain dist, Garfield County, U₃O₈

NEVADA PARK MNG CO
 P O Box 37, Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
 Idle
 (See Nev)

NEW PARK MINING CO
 901 Walker Bank Bldg, Salt Lake City
Pres & Gen Mgr: W H Crammer
VP & Mgr of Oper: Clark L Wilson
Sec: Robert L Cramer
Treas: R C Wilson
Purch Agt: Carl D Harper
MAYFLOWER MINE, Kestley, undergr, Au, Cu, Pb, Zn
Gen Supt: Gale A Hansen
Geol: Walter E Bauer
Prod: 120 tons

NORBUTE CORP
 Uranium Center Bldg, Grand Junction, Colo
VP: DeWitt C Deringer
Mgr, Western Mng Div: Abbott Charles Explorer
 (See N Y)

NORTH BINGHAM CONSOL MNG CO
 P O Box 37, Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
 Idle

NORTH STAR METAL MINES, INC
 612 Hamm Bldg, St Paul 2, Minn
Pres: John Moren
VP: Leif Bachke
Sec-Treas: Fred Schmalz
NORTH STAR & OLD HICKORY MINES, Milford, undergr, surface, WO₃, Cu, Ag, Au, Fe, U₃O₈
 Idle

800-TON PLOT MILL, at mine
Supt: George Bush
Mill Mgr: Keith Long
LEACHING PLANT, at mine

NORTHERN RESOURCES CORP

503 Atlas Building, Salt Lake City
CAMEL MINE, Deer Flat dist.,
 San Juan County, U₃O₈
 Explor

OL JATO URANIUM CO

28 W Broadway, Salt Lake City
 Pres: Owen W Bunker
 VP: Calvin Black
 Sec-Treas: Karl F Buell
WHIRLWIND MINE, Mexican Hat,
 San Juan County, undergr, U₃O₈
 Prod: 45 tons

OLYMPIC URANIUM CO

39 Exchange Pl, Salt Lake City
DWYER CLAIMS, Salt Lake County
 Ag. Pb, Zn, U₃O₈
 Under devel

PHILLIPS PETROLEUM CO. STRATEGIC MINERALS SECTION

Phillips Petroleum Bldg,
 Salt Lake City
 Dir: Clifford N Holmes
 Asst Dir: David C Arnold
 Mng Eng: Roger Caywood
 (See N Mex, Okla)

PIERCE & CASEY

52 1/2 S 400 E, Centerville
SILVERBELLE MINE, Box Elder
 County, open pit, Ag, Au, Pb, Fe,
 Cu, Mo
 Under devel

PIUTE URANIUM CORP

39 Exchange Place, Salt Lake City
 Pres: P H Hunt
 VP & Sec: D H Bullough
 Treas: D H Bullough
PROPERTIES, Beaver County, Pb,
 Zn

PLATEAU MNG CO INC

Box 397, Moab
 Pres: W D Nebeker, Jr
 VP: C E Flandro
 Sec-Treas: Maxwell Bentley
 Purch Agt & Gen Mgr: N Richard
 Seely

YELLOW CIRCLE MINES, undergr,
 open pit, U₃O₈, V₂O₅
 Prod: 20 tons
 (Subsidiary of The Westminster Corp)
 (See Colo)

PLUTUS MNG CO

608 Dooly Bldg, Salt Lake City
 Pres: Cecil Fitch
 VP & Gen Mgr: Cecil Fitch, Jr
 Sec & Purch Agt: W W Watson
PLUTUS MINE, Eureka, undergr
 Ag, Pb, Au
 Idle

PYRAMID URANIUM, LTD

608 Rood Ave, Grand Junction,
 Colo
 Gen Part: K Dean Butler
 (See Colo)

RADIUM KING MINES, INC

366 So 5th East, Salt Lake City
 Pres: Joe A Minton
 VP: Robert J Minton
 Sec-Treas: David L McKay
 Asst Sec: K B Christenson
 VP & Gen Supt: D F Harrison
 VP & Ch Geol: A E Flint
 Mech Eng: Chas A Schoer
LAKE MINE, Red Canyon dist, San
 Juan County, Cu, U₃O₈
 Mine Frm: W A Swank
 Mine Eng: Ed Carnahan
 Prod: 150 tons

RAINBO GOLD MINES CORP OF DELAWARE

P O Box 107, Marysville
 Pres: Louis C Deluke
 VP-Sec: Lucy Deluke
 Treas: A Paul Deluke
COPPER BELT MINE, Piute County,
 undergr, Au, Ag, Cu, Pb, Zn
 Under devel

RAMSHORN MINES CO

337 Felt Bldg, Salt Lake City
 Pres: W W Murray
 Sec: Leo Eager
 (Property under lease to Bayhorse
 Mines, Inc, Idaho)
 (See Idaho)

RARE METALS CORP OF AMERICA (Subsidiary of EL PASO NATURAL GAS CO)

1st Security Bldg, Salt Lake City
 Pres: C L Perkins (Box 1492, El
 Paso, Tex)
 VP & Asst Gen Mgr: M H Kline
 VP: R J Crowley
 Sec-Treas: Virgil Rittmann
 Asst Sec: Anne Kidd
 Ch Eng, Explor Dept: J R Reynolds
 Ch Geol: L A Hansen
 Supervisor Land Dept: R O Baldwin
 Supt, Production Dept: A A McKinney
 Supt, Explor Dept: E J Carlson
 Ch Chem: R Kronstadt
 Purch Agt: Claude J Jenkins
 Explor
 (See Ariz, Calif, Idaho, N Mex)

REALTY URANIUM & MNG CO, THE

937 Nat'l Bank Bldg, Denver 2,
 Colo
LUCKY STRIKE MINE, Shooting
 Creek, Henry Mts, Garfield County,
 undergr, surface, U₃O₈, V₂O₅
 (See Colo)

RICO ARGENTINE MNG CO

217 Kearns Bldg, Salt Lake City
 Pres & Gen Mgr: Sherman B Hinkley
 VP: J C Johnson
 Sec: L J Lerwill
 Treas: B B Hall
 (See Colo)

ROCARDO MNG CO (ALSO LEWIS & CHENEY MNG CO)

2400 So Redwood Road, Salt
 Lake City 4
 Own: David G Lewis, C Cheney, Jr
 Gen Mgr: Walter Williams
 Geol: Andrew Regis
RAINBOW GROUP, Millard County
 Under devel
 (See Nev)

ROCKY MOUNTAIN URANIUM CORP

1220 Mercantile Securities Bldg,
 Dallas, Texas
 Utah Agent: Critchlow, Watson &
 Warnock 1325 Continen-
 tal Bank Bldg, S L C
 Auditor: R D Warrington
RAINY DAY MINE, Circle Cliffs
 dist., Garfield County, U₃O₈

NORMAN ROGERS MNG CO

c/o Norman Rogers Box 1719
 Helena, Mont
NEW HOUSE CACTUS MINE, Milford
 Ids
 (See Cupric Mines Co)

ROYAL CORPORATION

206 N Virginia St, Reno, Nev
 Pres: Sidney D Achermann
 VP: Ronald F Sullivan
 VP-Treas: Aaron Richards
 Sec: Peter Anderson
ROYAL MINE, San Juan County,
 undergr, U₃O₈, V₂O₅
 Gen Mgr: Robert L Cranmer
 Geol: Thos Harrison
 Idle

ROYAL URANIUM CORP

Walker Bank Bldg, Salt Lake City
 Comptroller: F D Haddon
 Op: Boyles Bros Drilling Co,
 1921 So Main, Salt Lake City
ROYAL MINE (Indian Creek Group)
 Monticello dist, San Juan County,
 U₃O₈

SALT LAKE TUNGSTEN CO, THE

2189 Indiana Ave, Salt Lake City
 Pres: Blair Burwell
 VP: Marion E Pettigrew
 Sec-Treas: John J Davis

Purch Agt: E W Isham
**TUNGSTEN REFINERY, "Synthetic
 Scheelite"**
 Mill Supt: Leonard Marinelli
 Asst Mill Supt: Bemus Johnson

SAMSON URANIUM, INC

801 Sherman St, Denver, Colo
 Gen Mgr & Purch Agt: Robert T
 Martin
MINE, Moab, undergr, U₃O₈
 Idle
 (See Colo)

SAN FRANCISCO CHEM CO

Dr F, Montpelier, Idaho
ARICKEREE MINE, NE of Randolph,
 undergr, phosphate rock
 Gen Supt: Charles C Stephens
 (See Idaho, Wyo)

SEEGMILLER PRAT & ETHEL

Marysville, Utah
 Op: Vanadium Corp of America
FREEDOM MINE, Durkee Dist,
 Piute County, U₃O₈

SHASTA MINERALS & CHEMICAL CO

612 Dooly Bldg, Salt Lake City 1
 Pres: K L Stoker
 VP: Harper Hunsaker
 Sec-Treas: Reed L Reeve
 Asst Sec-Treas & Traffic Agt:
 Nancy C Hardman
 U₃O₈ Prod
 (See Calif)

SHOOTING CREEK MNG CORP

P O Box 186, Richfield
 Pres: John A Robertshaw
 Agent: Harold Ekker
VARIOUS CLAIMS, Henry Mt dist,
 Garfield County, U₃O₈
 Prod: 250 tons

SHUMWAY-MERWIN, BURDETT, EUGENE AND GLEN A And Radio Geophysical Co

San Antonio, Texas
 Blanding, Utah
PAY DAY MINE, Elk Mountain Dist,
 San Juan County, U₃O₈

SHUPE WADE AND NELLIE

Moab, Utah
 Sec-Treas: T J Christiansen
LAST CHANGE #1 MINE, Browns
 Hole dist, San Juan County, U₃O₈

SILVER BUCKLE MNG CO

804 Walker Bank Bldg, Salt Lake
 City
 Pres: Dr F E Scott
 VP & Gen Mgr: Clark L Wilson
 Sec: Alden Hull
 Treas: Jack D Gay
URANIUM PROP, Big Indian dist,
 San Juan Co
 Explor
 (See Idaho)

SILVER STANDARD MNG CO

39 Exchange Place, Salt Lake City
LAKES OF KILLARNEY MINE,
 Tooele County, Au
 (Explor by New Park Mng Co)

SIOUX MINES COMPANY

1114 Walker Bank Bldg, Salt Lake
 City
 Auditor: Glen Hardy
SIOUX MINE, Tintic dist, Utah
 County, Au, Ag, Cu
 (Lessee operation)
 Prod: 112 tons

L H SMITH MINING CO

Box 933, Monticello
 Gen Mgr: L H Smith
INDIAN CREEK MINES, undergr,
 U₃O₈, V₂O₅
 Under devel

STANDARD URANIUM CORP (STANDARD COL-U-MEX JOINT VENTURE)

264 South 4th East, Moab, Utah
 P O Box 595
 Pres & Gen Mgr: William R McCormick
 VP: Mitchell Melich
 Sec: Aaron Holman
 Treas: I Newton Brosen
 Asst Gen Mgr: Russell L Wood
 Purch Agt: James B King
BIG BUCK MINE, Big Indian dist,
 U₃O₈
 Mine Frm: Robert Hurst
 Geol: Robert R Ward
 (See Colo)

STANSBURG CONSOL MNG CO

Box 804, Grantsville
 Pres: E C Berry
 Sec-Treas: R C L Gehrig
DRAGON GROUP, N Willow Canyon,
 nr Grantsville, Tooele County,
 undergr, open pit, Pb, Cu, Ag
 Under devel

STAR DUST MINES, INC

No 4, 283 E South Temple
 Salt Lake City
 Pres & Gen Mgr: Fred Cook
 VP: Wm E Huyler
 Sec-Treas: W M Nance
STAR DUST MINE, Gold Hill, undergr,
 surface, WO₃
 Idle

STOCKS & GRAMLICH, INC

Moab, Utah
 Pres: H S Stocks
 Agent: Paul C Steinke, 164 E Center
 Moab

GREY DAWN AND FIRE FLY MINES,
 Paradox-LaSal dists, San Juan City,
 U₃O₈

STRATEGIC MINERALS EXPL CO

P O Box 1646, Grand Junction,
 Colo
 Managing Part: John I Scumacher
 Metallurgy & Oil: Harold C Anderson
PROPERTY, LaSal Creek & Red
 Canyon areas, U₃O₈
 Explor

SUNBURST URANIUM CORP

1875 NW Everett St, Portland 9,
 Oreg
SAN JUAN CLAIMS, Lander County,
 undergr, U₃O₈
 (See Nev, Oreg)

SUNSHINE MNG CO

738 Peyton Bldg, Spokane 1, Wash
RANSOM MINE, Box 474, Blanding,
 Cotton Wash, San Juan County,
 undergr, U₃O₈
 Gen Mgr: E E Eddy
 Mgr, Mng Div: John Edgar
 (See Idaho, Wash)

TANNER & TANGREEN

Box 665, Kirtland, N Mex
MINE, White Canyon, undergr,
 U₃O₈, Cu
 Gen Mgr: Lynn C Tanner
 Asst Gen Mgr-Geol: A C Tangreen
 Under devel

TEMPLE MOUNTAIN URANIUM CO

39 Exchange Place, Salt Lake City
 Pres: Herman Heinicke
 VP: Geo Heithecke
 Sec-Treas: Augustus Reeves
CLAIMS, Green River, Torrey,
 undergr, surface, Ag, Pb
 Prod: 183 tons
 (See Idaho)

TEXAS-ZINC MINERALS CORP

628 Rood Ave, Grand Junction,
 Colo
 Pres: A L Hayes
HAPPY JACK MINE, White Canyon
 via Blanding, undergr, U₃O₈
 Gen Supt: R E Radabaugh
 Mine Supt: E J Swapo
800-TON MILL, Mexican Hat, acid
 leach & solvent extraction
 Mill Supt: K C Aplan

THOMPSON, J R
Box 264, Danbury, Conn
Op: E E Lewis & Associates
BLACK STONE 1-9 MINES, Yellow
Cat dist, Grand County, U₂O₃

THOMPSON, WARREN BARRY
P O Box 1827, Denver, Colo
FROSS MINE, Washington County,
undergr, Au, Ag, Hg, V, O₂, U₂O₃
Gen Mgr and Lessee: W B Thompson
Under devel
(See Colo, N Mex)

THORNBURG MNG CO
140 W Main St, Grand Junction,
Colo
Own & Gen Mgr: Vance Thornburg
Sec-Treas: J T Tunnell
7 MILE MINE, 12 1/2 mi NW of Moab,
undergr, U₂O₃
Mine Supt: Edward G Johnson
Prod: 15 tons
(See Colo)

TINTIC LEAD CO
38 Exchange Place, Salt Lake City
Pres: P H Hunt
VP: D M Draper, Jr
Sec-Treas: D H Ballough
MINE, Milford, open pit, Cu
(Leased)

TINTIC STANDARD MNG CO
1114 Walker Bank Bldg, Salt
Lake City
Pres: H E Raddatz
VP: Roy M Jacobs
Treas & Gen Mgr: M D Paine
Sec: Glen Hardy
Eng-Geol: Fred W Hanson
TINTIC STANDARD MINE, Dividend,
undergr, Au, Ag, Cu, Pb, CaF₂
Under devel

TINTIC URANIUM CO
1114 Walker Bank Bldg, Salt
Lake City II
Pres: H E Raddatz
VP: L L Travis
Sec: Glen Hardy
Treas: M D Paine
MINE, Moab, U₂O₃
Geol: Fred W Hanson
Mine Supt: Ralph E Hawke
Frm: Lynn Hawks
Under devel

TOPAZ URANIUM CO
Idaho
Pres: Richard D Moody
VP: M Ward Moody
Sec: M J Moody
MINE, undergr, U₂O₃
Prod: 50 tons

TWO STATES URANIUM CO
Box 27, Bountiful
(See Wyo & Peterson, M F & Lorena,
in Nevada)

U-NEVA URANIUM CORP
Suite 101, 140 S Main St,
Salt Lake City I
Pres: Walter E Coggriff
VP: Sidney E Mulcock
Sec-Treas: Judge M K Snow
OURAY CLAIMS, Uintah County,
U₂O₃
SEE, TEMPLAR, HIRSEYE &
VERA CLAIMS, Emery County,
U₂O₃
MONTE CARLO, MONTE CHRISTO
CLAIMS, Tooele County, Hg, Pb
Under devel

**UNION CARBIDE NUCLEAR
CO, A DIV OF UNION
CARBIDE & CARBON CORP**
P O Box 1189, Grand Junction,
Colo
MINE, Green River, U₂O₃
Mine Supt: Gordon Irvine
MILL, Green River
Mill Supt: D M Pembroke
(See Calif, Colo, N Y)

UNITED MINERALS CORP
518 Felt Bldg, Salt Lake City
Pres & Gen Mgr: G W Snyder, Jr
VP: G W Snyder, H A Covy
Sec: Guy Snyder
(See Ariz, Nev)

**UNITED PARK CITY MINES
CO**
1007 Kearns Bldg, Salt Lake City
Pres: John M Wallace
VP: Frank A Wardlaw, Jr
Sec-Treas: J Wm Stoner
Purch Agt: T K Davis
MINES, Heber, Park City, undergr,

Pb, Zn, Ag, Au
Gen Mgr: S K Droubay
Gen Supt: G W De LaMare
Ch Geol: H V Stewart
Asst Gen Supt: Arthur Gray
Prod: 280 tons

U S LITHIUM CORP
1205 Walker Bank Bldg,
Salt Lake City
Pres & Gen Mgr: Paul T Walton
VP & Sec: H C Morgan, Jr
See Colo

UNITED STATES OYSPUM CO
300 W Adams St, Chicago 6, Ill
MINE, Sigurd, open-pit, gypsum
Works Mgr: R J Paschall
(See Calif, Colo, Conn, Ill, Ind, Iowa,
Mass, Mich, Mont, Nev, N Mex, N Y,
Ohio, Okla, Tex, Va)

**UNITED STATES SMELTING,
REFINING & MINING CO**
WESTERN OPERATIONS
New House Bldg (Box 1980),
Salt Lake City 10
VP & Gen Mgr, West Oper:
O A Glasser

Mgr, West Mines: Benton Boyd
Asst VP & West Mines:
Max M DuBois
Mgr, Midvale Plant: H L Johnson
VP & Ch Geol: R N Hunt
Indus Devel Dir: J M Ehrhorn
Ch Mech Eng, West Oper:
Boris Ashurhoff

UTAH OPERATIONS
U S & LARK MINE, Bingham dist,
Pb, Zn, Cu
Supt, U S Section: John Holmes
Supt, Lark Section: Harold Wells
MIDVALE PLANT, FLOT MILL &
LEAD SMELT
Mgr: H L Johnson
Gen Supt: C A Nelson
Mill Supt: A A Nelson
(See Alaska, Ariz, Mass)

U S STEEL CORP
COLUMBIA-GENEVA DIV
120 Montgomery St, San Francisco,
Calif
VP: L J Westover
Gen Supt: L F Black
BLAST FURNACE, Geneva, near
Fruro
(See Alaska, Ala, Calif, Miss, Pa,
Tenn, Wyo)

URANIUM CORP OF AMERICA
3955 S State, Salt Lake City
(See Colo, N Mex)

URANIUM KING CORP
320 Ness Bldg, Salt Lake City
Pres: Joseph Sherman
VP: Francis D Nielson
Sec-Treas: J A Bateman
COVE MINE, White Canyon, undergr,
Cu, U₂O₃
Prod: 30 tons
(Operated under a lease to C O G
Minerals Corp)

**URANIUM PROSPECTORS CO
LTD**
P O Box 67, Salt Lake City
Sec-Treas: H D Haight
JACK RABBIT MINE, San Rafael
Reef dist, Emery County, U₂O₃

URANIUM REDUCTION CO
537 1st Security Bldg, Salt Lake City II
Pres: Mitchell Melich
Exec VP: R A Young
VP: Charles A Steen
Sec: C M Christensen
Cont & Treas: John W Losse, Jr
Purch Agt: Rex Jones
MILL, Moab, Acid Leach, RIF
Gen Mgr: R F Hollis
Plant Supt: L A Painter
Asst Plant Supt: H W Unger
Ch Chem: Buford Wiam
Ch Met: T Iszo

UTAH ALLOY ORES, INC
Room 303, 101 N High St,
Columbus, Ohio
Sec: Simon Nash
YELLOW CAT MINE, Yellow Cat
dist, Grand County, U₂O₃

UTAH CONSTRUCTION CO
Box 970, Cedar City
Project Mgr: E C DeMoss
Mine Eng: York F Jones
Devel Eng: J H Olson
Office Mgr: E J Robison
Ch Acct: Rex E Harris
EXCELSIOR MINE, Iron Springs
dist, Iron County, Fe
Prod: 440,000 tons
(See Calif)

UTAH ORE SAMPLING CO
Box 217, Murray
Pres: E G Jensen
VP & Gen Mgr: Arnold Herlin
Sec-Treas: R E Allen
CUSTOM SAMPLING MILL
Mill Supt: J T Johnson

UTCO URANIUM CORP
310 1st Nat'l Bank Bldg, Denver,
Colo
(See Ariz, Colo, New Mex)

UTEX EXPLOR CO
P O Box 487, Moab
Pres: Charles A Steen
VP: Wm R McCormick
Sec: Mitchell Melich
Treas: Maxine Steen Boyd
Exec Asst: Mary Hope Westbrook
Comptroller: A T Ludlow
Purch Agt: Margie Shafer
MI VIDA MINE, undergr, U₂O₃
Gen Supt: Virgil Bilyeu
Geol: Max Pierson
Asst Supt: Ted Barrett
Mine Frm: Hall Thorne
Chemist: Lauren Ball

VANADIUM CORP OF AMERICA
Maryvale
Pres: W C Keeley
VP & Gen Mgr: D W Viles
PROSPECTOR, FREEDOM & FARMER
JOHN MINES, Maryvale, undergr,
U₂O₃
Mine Supt: Maurice Castagne
Geol: E E Waulters
(See Ariz, Colo, N Mex, N Y)

VANURA URANIUM, INC
Marshall Court, Moab
Pres: William T Swift
VP: Ellis R Cook, Jr
Field Superv: Everett Blackburn
(See Colo)

VITRO URANIUM CO
(A DIV OF VITRO CORP OF AMERICA)
400 W 3300 So St, Salt Lake City
Pres: W B Hall
Asst to Pres: R N Miller
VP: R C Cole
Sec: W H Denne
Treas: R T Ruder
Office Mgr: H D Haight
Purch Agt: C A Theobald
88 TON HYDROMETALLURGICAL
PLANT, Salt Lake City
Mkt: L D Lash
Oper Supt: M T Ellis
Pl Eng: T G Rukavina
Prod Mgr: J D Moore
Ore Buyer: R B Coleman
Ch Chem: G W Hansen
(See Wyo)

**VULCAN URANIUM MINES
INC**
1129 Tenth Ave North, Seattle 2,
Wash
Pres: Herman J Rosal
VP: W J Logus
Sec: M A Logus
CANCER CURE & ADJOINING CLAIMS,
San Rafael Swell, Emery County

WALKER ENGR CORP
612 Doody Bldg, Salt Lake City
Pres: W J Walker
VP: R T Walker, Jr
Sec: Belle T Walker
(See Colo, Idaho)

WASATCH MINES CORP
38 Stock Exchange Pl,
Salt Lake City
Lessee: Olympic Uranium, Inc,
525 Newhouse Bldg, S L C
WASATCH MINES NO 5, Little
Cottonwood dist, Salt Lake County,
Au, Ag, Cu, Pb, Zn
Under devel

WEST PARK MINING CO
Box 486, Provo
Pres: J H Peterson
VP: J Rulon Morgan
Sec-Treas & Purch Agt: Dean W Payne
WEST PARK MINE, 3 mi S of
Brighton & 6 mi NW of Midway,
undergr, Cu, Au, Ag
Gen Mgr: Arvil H Scott
Geol: E A Hewitt
Prod: 8 tons

WEST PAY DAY MINES
P O Box 1686, Grand Junction,
Colo
Trustee & Partner: R B Daniel
WEST PAY DAY MINE, White Canyon
dist, San Juan County, U₂O₃

WEST TOLEDO MINES CO
38 Exchange Place, Salt Lake City
Pres: Sid Spencer
Sec-Treas: David H Ballough
MINES, Altn, Little Cottonwood
dist, undergr, Pb, Ag

**WESTERN GOLD & URANIUM
INC**
Box 158, St George
Pres: Ralph G Brown
VP: David P Shira
Sec: Berene Backus
Cons Met: Alan Kisecek
Cons Eng: C E Prior
SILVER REEF MINE, Leeds, undergr,
U₂O₃, Ag, Cu
Gen Supt: Richard V Syman
Mine Supt: Jack K Howell
Asst Mine Supt: Carl Vanlaningham
Mias Frm: Carlyle Stirling
Prod: 150 tons
APPLEGARTH MINE, Maryvale,
Altnite
Gen Supt: Richard V Wyman
Ch Geol: Max E Kofford
Under devel
75 TON SILVER FLOT MILL,
Silver Reef
Mill Supt: Jack K Howell
Asst Mill Supt: Carl Vanlaningham
Assay: Art Eastman
(See Ariz, Colo)

**WESTERN ORE & ALLOY
CORP**
1375 S State St, Salt Lake City 15
Pres & Gen Supt: Grif Williams
VP: Rulon Garner
Sec: Randall N Mabey
YELLOW HAMMER, FRANKIE MINES,
Bold Hill, undergr, open pit, Cu,
Au, Ag, WO₃
50 TON FLOT GRAV MILL, Gold Hill

WESTMINSTER CORP
416-20 1st Nat'l Bank Bldg,
Denver, Colo
Pres: David W Adams
VP: Melvin C Bowles
VP & Treas: T R Lewisby
Sec: Jim T Holman
CAMEL MINE, Deer Flats, U₂O₃
BOOMERANG, BOOMRANGE,
ESCARPMENT & GERTRUDE
MINES, White Canyon, U₂O₃
Under devel
(See Ariz, Colo, Nev, Wyo)

WHELCHER MINES CO
1018 Arthur St, Caldwell, Idaho
Pres: William E Whelchel
VP: Ralph A Whelchel
Sec-Treas: Thressa M Whelchel
MEGATON & PLUTONIC GROUP,
U₂O₃, V₂O₅
Under devel
(See Nev)

WHITE CANYON MNG CO
200 N 6th St, Grand Junction,
Colo
Pres: A L Hayes
VP: T R Redman
Sec: Walter E Will
Treas: E E Schweigler
Purch Agt: John H Crawford
HIDEOUT & WHITE CANYON NO 1
MINES, San Juan County, undergr,
U₂O₃, Cu
Mgr: A F Boyd
Geol: Carl F Lipp
Surv: James R Franklin
Mine Supt: Robert V Hancock
Asst Mine Supt: P H Lambertson
Mine Frm: Wilbert Hancock,
Lester Hancock
Prod: 250 tons

WILSON, HOWARD
 Gallup, New Mexico
TAYLOR REID #1 MINE, Monument
Valley dist, San Juan County, U₂O₃
Prod: 572 tons

WOODMONT, INC
(Wholly owned subsid of CONTINENTAL
URANIUM, INC)
820 S Ninth St, P O Box 1550
Grand Junction, Colo
RATTLESNAKE MINE, Moab, open
pit, U₂O₃, V₂O₅
Mine Supt: John Roscoe
Prod: 160 tons

**YANKEE CONSOLIDATED
MINES CO**
c/o Rom Warburton
Kearns Building, Salt Lake City
Sec-Treas: Rom Warburton
YANKEE CONSOLIDATED, Tintic
dist, Utah County, Au, Ag, Cu, Pb, Zn

VERMONT

APPALACHIAN SULPHIDES INC

6th Flr, 360 Bay St, Toronto, Ont, Canada
 Pres: J Cunningham-Dunlop
 VP: W H Woods
 Treas: H E Nause
 Sec: Philip Bastedo (New York City)
 ELIZABETH MINE, South Stratford, undergr, Co, Ag
 Idle
 950-TON FLOT MILL, South Stratford (See N C)

EASTERN MAGNESIA TALC CO, INC

Baldwin Ave, South Burlington
 Pres: E W Magnus
 VP & Gen Mgr: W W Magnus
 Treas: R F Patrick
 Gen Supt: V A Backels
 Eng: L H Durkee
 NO 2 MINE, 2 mi S of Waterbury, undergr, talc
 Mine Frm: Earl Clifton
 Prod: 100 tons
 MINE #3, Hammondsville, open pit, Mine & Mill Supt: Winston Desaine
 Prod: 80 tons
 100-TON DRY GRINDING MILL, South Burlington
 Mill Supt: M G Eastman
 NO 4 MINE, 1/2 mi N of Johnson, undergr, talc
 Mine & Mill Supt: Roger W Perkins
 Mine Frm: Cliff Allen
 Prod: 200 tons
 190-TON FLOT-DRY GRINDING MILL
 Mill Frm: Ken Stewart

RUBEROID CO, THE

500 Fifth Ave, New York, N Y
 VERMONT ASBESTOS MINE DIVISION,
 Hyde Park
 MINE, Lowell, open pit, chrysotile, asbestos
 Gen Mgr: I E Matthews
 Asst Gen Mgr: W M Page
 Geol: L Jordan
 Mech Eng: E E Lanphere
 Mine Supt: I M Potter
 Asst Mine Supt: R O'Hear
 Mine Eng: R K White
 MILL, air separation
 Mill Supt: C C White
 Asst Mill Supt: R C Wescom
 (See N Y)

VERMONT KAOLIN CORP

150 Cherry St, Burlington
 c/o P F Furgis and Company
 MINE, Monkton, kaolin
 Under devel

VERMONT TALC CO

Chester
 Pres: T A Yager
 Sec: Gilles Blague
 MINE, undergr, talc
 Mine Supt: Frederick De Zaine
 Mill, Chester

VIRGINIA

ALLIED CHEM & DYE CORP, GEN CHEM DIV

Box 388, Galax
 GOSMAN MINES, 6 mi N of Galax, undergr, phrrhotite concentrates
 Gen Mgr: R H Dickson
 Supt: James O Nichols
 Mine Frm: R F Dillon
 Asst Supt: A H Yarbree
 1000 TON FLOT-GRAY MILL
 Mill Frm: O W Manuel
 (See Colo, N Y)

AMERICAN CYANAMID CO, PIGMENTS DIV

Piney River
 MINE, open pit, ilmenite & apatite
 FLOT-MILL, Piney River
 Mine & Mill Supt: L L Campbell
 PLANT
 Plant Mgr: J S Carter
 Asst Plant Mgr: J F Hopkins
 Mech Eng: J M McConaghy
 Elec Eng: J Wilson
 (See Ark, Fla, Ga, NY)

AMERICAN PIGMENT CORP

Hawesee
 Exec VP: R G Fizer
 Iron Oxide Pigments

CLINCHFIELD SAND & FELD-SPAR CORP

Plant Mgr: W A Nance
 COLES, CRESWELL, MITCHELL & PEAKESVILLE MINES, Feldspar

FOOTE MINERAL CO

16 W Chelten Ave, Philadelphia 44, Pa

SUNBRIGHT DIVISION, Duffield
 c/o Edwin Dill, Jr
 MINE, Sunbright, undergr, limestone
 Gen Mgr: A McDonnell
 Asst Gen Mgr: W Hudspeth
 Geol: T Kesler
 Mine Supt: T Evans
 Mine Frm: J Hughes
 MILL, at mine
 CHEMICAL PLANT, at mine
 (See N H, N C, Pa, Tenn)

INTERNAT'L MINERALS & CHEMICAL CORP

Piney River
 APLITE MINE
 Supt: Claude Ellis
 Prod: 100 tons
 (See Ariz, Colo, Fla, Ill, Me, Miss, N Mex, N C, Ohio, S D, Tenn, Wyo)

KYANITE MINING CORP

BAKER MOUNTAIN MINE, Cullen, open pit, kyanite
 WILLIS MT MINE, Dillwyn, open pit, kyanite
 Pres: Gene Dixon

METAL & THERMIT CORP

Hawesdam
 MINE, open pit, Rutile, ilmenite
 Pl Mgr: L W Forbes

NATIONAL GYPSUM CO

Kumblains
 MINE & PLANT, undergr, limestone
 Mine Eng: L G Grebb
 Plant Mgr: Monroe Rule
 Prod: 2000 tons
 (See Ind, Iowa, Kans, Mich, N Y, Ohio, Pa, Texas)

NEW JERSEY ZINC CO

Austaville
 BERTHA MINERAL DIV MINE, Zn, Pb
 Mine Supt: K R Winslow
 2,000-TON FLOT MILL
 Supt: W L Albers
 (See Colo, Ill, N J, N Mex, N Y, Pa, Tenn, Wis)

REYNOLDS MINING CORP

Reynolds Metal Bldg, Richmond
 Pres: Walter L Rice
 VP: R H Zieglin, J Louis Reynolds
 VP & Treas: C E Coghill
 Sec: Allyn Dillard
 Ch Geol: John D Moses
 Safety Eng: J E Nichols
 Purch Agt: M W Henry
 (See Ark, Colo)

RIVERTON LIME & STONE CO

RIVERTON LIME & STONE CO
 Dominion Mineral Div, Piney River
 APLITE MINE
 Plant Mgr: R C Brand

TRI-STATE ZINC, INC

70 Pine St, New York, N Y
 VP & Gen Supt: V C Allen
 BOWERS-CAMPBELL MINE, Timberville, undergr, Zn
 Gen Supt: Daniel Geary
 Mine Supt: Carl Box
 Prod: 750 tons
 750-TON FLOT MILL, Timberville
 Mill Supt: M C Bailey
 (See Ill, N Y)

U S GYPSUM CO

Plasterco
 Works, Mgr: H D Decker
 NUMBERSIX MINE, at Plasterco, undergr, gypsum
 Mine Supt: E M dea Hookere
 Gen Frm: D R Davis
 Prod: 1,000 tons
 (See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah)

VIRGINIA-CAROLINA CHEM CO

48 E Main St, Richmond 8
 Pres: William H Wilson
 VP: C E Heinrichs

Sec: Richard E McConnell
 Treas: I D Dawes
 Purch Agt: Douglas W Laird
 (See Fla, Tenn)

WASHINGTON

ADDY DEVELOPMENT CO

E 949 43rd, Spokane
 WASHINGTON METALS MINE,
 Stevens County, SE of Addy, undergr,
 WO,
 25-TON MILL, in SE 1/4
 (Lessees George Monroe & Frank
 Birch)
 Au, Zn
 Idle

ALDER GOLD COPPER CO

Box 1140, Spokane
 Pres: E Royce
 Sec: R K Magney
 Treas: Harvey F Stone
 ALDER MINE, Twisp, undergr, Cu,
 Au, Zn
 Idle
 300-TON FLOT MILL

ALEXANDER MINING CO

1230 E 89th, Seattle 15
 c/o Alexander J Akishin
 THREE "B" GULCH PROP, King
 County, undergr, Zn, Pb, Ag
 Idle

AMERICAN SILVER MNG CO

123 W 4th Ave, Spokane
 Pres: H C Snyder
 VP: J M Henneck
 Sec & Treas: L B Conrad
 (See Idaho)

AMERICAN SMLTG & REF CO

Box 68, Colville
 NORTHPORT UNIT, surface, Zn, Pb
 Supt: P A Lewis
 Frm: Frank Paparich
 Acct: Fred Harding
 Prod: 1,000 tons
 1,000-TON FLOT MILL
 Mill Supt: R K McCallum
 Assayer: Wilson Tooke
 Plant Idle
 TACOMA SMELTER, Box 1606,
 Tacoma, Copper smelter, Electrolytic
 refinery, arsenic refinery &
 acid plant
 Mgr: R E Shinkosky
 Asst Mgr: G E Sigler
 Gen Supt: C R Low
 Purch Agt: J F Vogel
 (See Ariz, Calif, Colo, Idaho, Ill, Kans,
 Md, Mont, Neb, N J, N Mex, N Y, Tex,
 Utah, Wash & Federal Mng & Smelting
 Co, Mo)

AMERICAN ZINC, LEAD & SMELTING CO

927 Old Nat'l Bank Bldg, Spokane
 Western Mgr: R E Calhoun
 Purch Agt: R F Tharp
 GRANDVIEW MINE, Metaline Falls,
 undergr, Zn, Pb
 Res Mgr: John W Currie
 Mine Supt: C P Sage
 Assay: F H Shellenberger
 Mine Frm: C L Sage
 Mine Eng: R J Lampson
 Prod: 650 tons
 750-TON FLOT MILL
 Mill Supt: D A Underwood
 (See Ariz, Ill, Mo, Ohio, Okla, Tenn,
 Tex, Wis)

BASIC MINERALS LTD

Grand Forks, B C, Canada
 LAST CHANCE CONSOL MINE,
 Stevens County, Pb, Zn
 Mgr: Herb Bennett

BIG SMOKE URANIUM, INC

725 Paulsen Bldg, Spokane 1
 Pres: Wm O Kumbura
 VP: Eugene A Kumbura
 Sec & Treas: Martha Diehm
 BIG SMOKE MINE, Spokane Indian
 Reservation, open pit, U₃O₈
 Geol: Kenneth Russell
 Under devel

BUNKER HILL CO, THE

The Bunker Hill Bldg, 680 Market
 St, San Francisco 4, Calif
 Ch of Bd: Stanley A Easton
 Pres: John D Bradley
 VP: Emmett G Solomon, W G Woolf,

DL Feathers, R H Cutting
 Sec: D L Feathers
 Treas: Emmett G Solomon
 Purch Agt: GU Mayes, Kellogg, Idaho
 BONANZA MINE, Colville, Pb, Ag
 Under devel
 FABRICATION PLANT & SECONDARY
 LEAD SMELTER, 2700 16th Ave, SW,
 Seattle 4, Wash
 Prod Mgr: Alvin Kroll
 VP, Sales & Fabrication: Roger H
 Cutting
 (See Colo, Idaho)

CAMBRIAN MNG CO

525-27 Hutton Bldg, Spokane
 Pres: Lloyd E Sherrill
 VP: Theodore Kary
 Sec-Treas: Kenneth R Bagdon
 PROSPECTS, Stevens & Pend Oreille
 Counties, open pit, U₃O₈, Pb, Cu,
 Zn, WO₃
 Under devel

CHROME CLIFF MNG CO

1315 Dudley Ave, Prosser
 Pres: Fred W Wagner, Jr
 VP: Bert Thomburg
 Treas: Thomas West
 CHROME CLIFF, QUEEN CAROL &
 KROME KING MINES, undergr &
 open pit, Cr
 Gen Mgr: James Dow
 Idle

CLAYLOON URANIUM CO, INC

319 Peyton Bldg, Spokane 1
 HUFFMAN LEASE, Spokane County,
 U₃O₈
 Under devel

CLEAR WATER MINES, INC

401 Empire State Bldg, Spokane 1
 Pres: H G Loop
 VP: John Healy
 Sec-Treas: E I Fisher
 Purch Agt: John Healy

CONSOL MINES & SMELTING CO, LTD

Star Rt, Wilbur
 Pres: Hugh Brown
 VP: Jack Blaine
 Purch Agt: Douglas Brown
 Sec: E H Edgar
 Treas: D H Gellatly
 THREE PROPERTIES at Keller,
 Ferry County, undergr & surface,
 Cu, Mo, Pb, Zn, Mn, U₃O₈
 Under devel

CRYSTAL CITY MNG CO

17127 E Sprague St, Greenacres
 Pres: Luke Williams
 VP: Charles M Williams
 Treas: Tom Spauldner
 CRYSTAL MINE, Lincoln County,
 undergr, Miles area, Ag, Pb, Cu,
 WO₃
 Under devel

DAHL URANIUM MINE, INC

Pres: H J Tibbitts
 DAHL MINE, Mt Spokane area,
 U₃O₈
 Under devel

DAY BREAK URANIUM, INC

12707 Valleyway, Opportunity
 Pres: James W Fox
 VP: A Alvensleben
 Sec-Treas: Kae H Sowers
 DAY BREAK MINE, open pit, autinite,
 uraninite, coffinite
 Mine Supt: E A Collins
 Geol: H W Norman
 Met: J Fred Williams, Jr
 Prod: 100 tons

DAWN URANIUM & OIL CO

422 Paulsen Bldg, Spokane
 Pres: Gaylen Jones
 VP: Charles Wieber
 Sec-Treas: C R Echlin
 SMITH, WILSEMORE LEASE, &
 CURTIN FARM MINE, Spokane County,
 U₃O₈
 Under devel

DAWN MINING CO

Ford
 Pres: G S Hinesdale
 MIDNITE MINE, Stevens County
 1918 S Post St, Spokane, U₃O₈
 Gen Mgr: R B Fulton
 Asst Gen Mgr: Don Hargrove
 Under devel

DEER LAKE TUNGSTEN MINE
Box 384, Deer Park
Mng: W H West
MINE, Blue Grouse Mt, undergr,
surface, WO₃
Prod: 25 tons
25-TON GRAV MILL

DELMAR MNG & MFG CO
N 5018 Lincoln, Spokane 19
Pres: Norman E Mills
VP: Adolph Oberst
Sec: Harry O Klaus
(See Idaho)

DEVIL'S CANYON MNG CO, INC
801 Central Bldg, Seattle 4
Pres & Gen Mgr: Vernon M Osterberg
VP: Edwin Saurers
Sec: W D Gotham
Treas: Dr G M Osterberg
DEVIL'S CANYON MINE, Buena
Vista Mng dist, King County, undergr
& open pit, Cu, Mo, WO₃, Ag, U₃O₈
Under devel

EAGLE PEAK COPPER MINING CO
Box 86, Ashford
Pres: R H Wheelock
VP: Eva Crisman
Sec-Treas: R P Crisman
MINE, Lewis County, undergr, Cu,
Au
Gen Mgr: R H Wheelock
Under devel
FLOT MILL, Pierce County
Under constr

EVERGREEN MINES, INC
5002 Ivanhoe Pl NE, Seattle
Pres: John Wiat
EVERGREEN MINES NO 1 & 2,
Whatcom County, Pb, Zn, Cu, Au,
Ag
Under devel

GENERAL MINES CORP
401 Empire State Bldg, Spokane 1
Pres: H G Loop
VP: Chris Roholt
Sec-Treas: E I Fisher
Purch Agt: Harry Linden
GENERAL MINES, undergr
Gen Mgr: H G Loop
Mine Supt: Norman Ross
Asst Supt: Joe Hollingsworth
Under devel

GOE-RESOURCE CORP
526 Hutton Bldg, Spokane 4
Pres: W D Weaver
BLUE MOUNTAIN PROPERTY,
Stevens County, U₃O₈
Under devel

GERMANIA CONSOL MINES, INC
401 Empire State Bldg, Spokane 1
Pres & Gen Mgr: Henry J Franz
VP: H G Loop
Sec-Treas: E I Fisher
GERMANIA CONSOL MINE, Hunters,
undergr, WO₃, U₃O₈
40-TON GRAV-FLOT MILL, hunters
Mile

GLADSTONE MT MNG CO
202 Radio Central Bldg, Spokane
Pres: Wm H Swann
VP: Fred W Viles
Sec-Treas: E E Nicholls
GLADSTONE MINE, at Leadpoint,
Pb, Ag
Lessee: A G Lotze

GLACIER MINING CO
Box 11, Glacier
Mng: J R Atkeson
MIDAS MINE, Glacier area, Cu, Ag,
Au
Supt: Wm A Farrow
Under devel

GOAT CREEK MNG & DEVEL CO
Mazama
Pres: Alva R Sharp
Mng: Robert G Stewart
SILVER KING, APRIL, GOLD
MOUNTAIN, GOLD BOB, &
SUNVIEW MINES, Mazama, undergr,
Cu, boron, magnetite, WO₃, Pb, Ag,
Au
Under devel

GOLDBEL MNG CO
1125 N "K" St, Tacoma 3
Own: Ben E Luecke
SEPMAN MINE, undergr, quicksilver
Mine Supt: Floyd Ray

Mine Eng: Matthew Maddess
MILL & SMELTER, Morton
Assay: Galen Price

GOLD BOND MINING CO
300 Columbia Bldg, Spokane 4
Pres: Frank Lilly
MINE, Chelan County, Au, Ni
Under devel

GOLDFIELD CONSOL MINES CO
Box 2520 or 206 N Virginia St,
Reno, Nevada
Res Mgr: T Higginbotham
ANDERSON MINE, Leadpoint dist,
Zn, Pb
Under devel

GOLDSTONE MNG CO
511 Securities Bldg, Seattle
Pres & Gen Mgr: B W Forter
VP: Lynn Gunning
(See Idaho)

GRANDVIEW MINES
310-311 Radio Central Bldg
Spokane 4
Pres: Karl W Jasper
VP: Paul Hootzel
Sec: E K Barnes
GRANDVIEW MINE, Metaline, Zn,
Pb
Prod: 300 tons
(Operated by American Zinc, Lead &
Smelting)

H & R CORP
2121 Everett Ave, Everett
RAINEY CLAIM & OTHERS, Taylor
R dist, King County, Au, Ag, Cu, Pb,
Zn
Mile

HERA EXPLOR CO
Box 8, Renton
Pres & Gen Mgr: W H Pillatos
VP: Dr W J Collins
Sec: George Ames
Met-Geol: J J Sherwood
MINE, Wallace Creek Mng dist,
undergr
Mine Frm: Sidney Ward
100 TON FLOT MILL, Wallace Creek
Mng dist,
Mill Supt: J R Bartlett

HYDER MINES INC
804 4th Ave, Seattle 4
Pres: Donald H McNelly
VP: Edward R Wheat
Sec-Treas: J W Boothe
Purch Agt: Dr R L Camber
(See Alaska)

INDUSTRIAL MNG INC
RR 3 Box 250, Sedro Woolley
Pres: F F Nielson
VP: G W Wright
Sec-Treas: Nellie Nielson
MINE, Twin Sisters area, Cr
Under devel

INLAND EMPIRE MINING CO
Marine Drive, Port Angeles
Pres: E R Gehrbke
VP: E H Fitzgerald
Sec-Treas: M E Oldring
Gen Mgr & Gen Supt: Elder C Lucier
Purch Agt: E R Gehrbke or E Lucier
HURRICANE #1 & ED "B", Box 448,
Port Angeles, surface, Mn
Under devel
150 TON GRAV & LEACHING MILL,
C to E Sta, Marine Dr, Port Angeles
Mill Supt: E C Lucier

ISBELL CONST CO
Box 2351, Reno, Nev
MIDNIGHT MINE, Spokane Indian
Reservation, contract mng for Dawn
Mng Co
Supt: John Amberson
(See Ariz, Idaho, Nev, Utah)

KASLO MINES CORP
401 Empire State Bldg, Spokane 1
Pres & Gen Mgr: H G Loop
VP & Asst Gen Mgr: E D Thompson
Sec-Treas: E I Fisher
KASLO MINE, in Canada (Howser, BC)

KNOB HILL MINES, INC
206 Sansome St, San Francisco,
Calif
Pres: H N Kuechler, Jr
VP: A R Patterson
Sec: D D Farley
Treas: L E Heller
KNOB HILL MINE, Republic, undergr,
Au, Ag
Mine Supt: J E Davis
Mine Frm: F E Jordan

Mine Eng: L R Batwater, Jr
400-TON FLOT MILL, Cyanidation
of tailings
Mill Supt: Louis Lembeck
Mill Frm: R A Kells
Mill Assay: A D Brenner

L & N MINING CO
1129-10th Ave N, Seattle 2
Pres & Gen Mgr: W J Logus
VP: V R Newbury
Sec-Treas: M A Logus
Geol: Forbes Robertson
(See Nev)

LASOTA JONES CO
Metaline Falls
MINE, Pend Oreille County, Slate
Cr dist, Zn, Pb
Under devel

LITTLE KING TUNGSTEN MINE
Box 384, Deer Park
LITTLE KING TUNGSTEN MINE,
Blue Grouse Mt, WO₃
Mng: W H West
Prod: 12-15 tons
25-TON GRAV MILL, at mine

LOVITT MNG CO, INC
Box 1668, Wenatchee
Pres: E H Lovitt
VP: Vere McDowell
Purch Agt: David Morvee
GOLD KING MINE, 3 mi S of
Wenatchee, undergr & surface, Au,
Ag, silice
Mine Frm: Ben Richards
Mine Eng: Oscar Thompson
Prod: 250 tons

MARCEAR, TED & AL (LESSEES)
Eban
ACE OF DIAMONDS MINE, Au
Under devel

MARTY, JOHN & MEDDOCK, MARVIN
Rice
AGUILA LEAD SILVER MINE, Ag,
Cu, Pb
Under devel

MINERAL GORGE MNG & DEVEL CO, INC
3011 S Monroe St, Tacoma 5
MINE, Spokanish County, index dist,
Cu, Au, Ag
Under devel

MUDHOLE EXPLOR, INC
712 Hutton Bldg, Spokane 4
Pres & Gen Mgr: Adolf Nissen
VP: Ralph E Umbreit
Sec-Treas: Diane H Watters
EXPLOR, surface, U₃O₈
Under devel

NEW RAINBOW MNG CO
647 Peyton Bldg, Spokane 1
WEBER MINE, in Idaho
(See Idaho)

NEW WELLINGTON MINES, LTD
640 Montreal St, Victoria, B C,
Canada
BEAR CREEK MINE, Clallam
County, Mn
(Closed during winter)

NEW YORK - ALASKA GOLD DREDGING CORP
1616 Smith Tower, Seattle, Wash
Pres & Man Dir: J K Crowley
VP: G G C King
Sec: Leise G Robbins
Treas: Fannie Bailey
Purch Agt: L E Robbins
(See Alaska)

NORTH STAR URANIUM, INC
417 Paulsen Bldg, Spokane 1
Pres: John F Campbell
VP: A F Larson
Sec: A C Townsend
Treas-Purch Agt: Sam Farber
LEMBRECHER LEASE, Spokane
County, U₃O₈
Under devel

NORTHERN PLAINS EXPLOR CO
640 Seventh Ave, W, Calgary,
Alberta, Canada
DEER, TOGO & TURK MINES, Deer
Trail dist, Stevens County, Ag, Cu
Under devel

NORTHWEST MAGNESITE CO
Chewelah
Pres: E A Garber
VP: C A Sargent
Sec-Treas: J C Stivers
Gen Mgrs: H A Ziebell
Plant Supt: Barney Endrice
Plant Eng: Clyde Holen
Purch Agt: L A Knight
RED MARBLE MINE, 20 mi SE of
Chewelah, surface, magnesite
Mine Supt: Roger L Fisk
Mine Frm: Lloyd King, John Estes
Mine Eng: J Brammer
Prod: 2,000 tons
3,000-TON FLOT MILL & HEAVY
MEDIA
Mill Supt: T W Morton

NORTHWEST MINERALS INC
730 Peyton Bldg, Spokane 1
Pres: Forrest M Garrett
VP: H E Besly
Sec-Treas: Don A Gillis
Purch Agt: Don A Gillis
WYNCOOP LEASE, Wellpoint,
undergr, U₃O₈
Cons Eng: Sam Richardson
Fld Geol: David M Berry
Explor
(See Idaho)

NORTHWESTERN MNG CO
P O Box 3791, Seattle 24
(See California)

NORTHWEST REFIN & CHEM CO
N 125 Park Rd, Spokane 62
Pres: Wm Helander
VP: Leo Timm
Sec-Treas: John A Allen
CUSTOM SMELTER, Dishman
Smelter Supt: Wm Burkwardt
Prod: 6,000,000 lbs Zn oxide yrlly

NORTHWEST URANIUM MINES, INC

Box 1048, Wallace, Idaho
Pres: F E Scott
VP & Gen Mgr: Clark L Wilson
Sec: Alden Hull
Treas: Jack D Gay
NORTHWEST URANIUM MINES,
E 3723 16th Ave, Spokane, open pit,
U₃O₈
Gen Supt: Geo L Cloward
Prod: 400 tons
400-TON MILL, Wellpoint, acid
leach
Under constr
PETER'S LEASE, Spokane, Indian
Reservation, open pit, U₃O₈
Under devel

OLYMPIC MANGANESE MNG CO
1129 10th Ave North, Seattle 2
Pres & Gen Mgr: W J Logus
Sec-Treas: M A Logus
TUBAL-CAIN MINE, 15 mi W of
Quilcene, undergr, Mn
Mile

PEND OREILLE MINES & METALS CO
923 Old Nat'l Bank Bldg
Spokane 1
Pres: Jens Jensen
VP: A W Witherspoon
VP: John D Bradley
Sec & Treas: A C Wimberly
Consultant: W L Zeigler
Purch Agt: R G Walke
Mng: L M Kinney
Supt: L G Billings
PEND OREILLE MINES, 3 mi N of
Metaline Falls, undergr, Zn, Pb
Frmm: Cregg Cody
Mine Eng: Paul McIlroy
Ch Eng & Geol: Roy A Anderson
Prod: 2,000 tons
2, 400-TON FLOT MILL, Metaline
Falls
Mill Supt: J C Crampton
Assayer: R W Townsends
Ch Elec: R A Skeman

REPUBLIC COPPER CO
Box 304, Zillah
Pres: John Higgins
WALLA WALLA GROUP, Ferry
County, Cu, Ag, Au
Under devel

ROYAL NORTHWEST MNG & SALES CO
2027 E Bismark Ave, Spokane
Own: R E & W E Mast
10 MINING CLAIMS, Northport Mng
dist, undergr
2 MINING CLAIMS, Boasberg Mng
dist, undergr, Ag, Au, Pb, Zn, Mo
Under devel

SAGINAW GOLD & COPPER MINES INC

500 Gladstone St, Bellingham
Pres: R L Averill
VP: Joe Westhoff
SAGINAW MINE, Whatcom County,
Ca, Au, Ag
Under devel

SENCO INC

308 Fidelity Bldg, Spokane
(for Box 844, Davenport)
Pres: O L Nichols
VP: Dave Nogle
Sec: Lorella Nichols
Treas: Frank Case
SENCO NO 1 MINE, 8 mi N of Orient,
Surface, U₃O₈
Under devel

SHERMAN MNG CO

Rt 1, Box 247, Omak
Pres: C C Sherman
VP: W E Sherman
Sec-Treas: T H Hohn
SHERMAN MINE, Okanogan County,
Pb, Zn, Au
Under devel

SILVER DOLLAR MNG CO

809 W Sprague Ave, P O Box 122
Spokane 18
Pres: Elmer E Johnston
VP: Leigh E Nicholls
Sec-Treas: W T Anderson
Purch Agt: W J Carlson
(Property oper by The Sunshine Mng Co & Polaris Mng Co)
(See Idaho)

SPOKANE-IDAHO MNG CO

611 Peyton Bldg, Spokane 1
Pres: Frank N Marr
Sec: C D Randall
Treas: Charles E Marr, Jr.
(See Idaho)

SUNSHINE MNG CO

739 Peyton Bldg, Spokane 1
Pres: Robert M Hardy, Jr.
VP: C M Hull
Sec-Treas: Frank M Hardy
Asst Sec: Stanton B Bennett
Asst Treas: Vincent P Whelan
Gen Mgr, Mng Div: John Edgar
Gen Mgr, Petroleum Div: A F Wynn
(See Idaho, Utah, Ariz)

TREASUREMONT MNG CO

1129 10th Ave N, Seattle
Pres & Gen Mgr: W J Logus
Sec & Treas: M A Logus
(See Idaho)

TWIN SISTERS MAGNESIUM & CHROME CORP

1101 Terminal Sales Bldg, Seattle
Pres: Alwyn H Wild
Exec VP: A L Atherton
Sec: Marian Wild
Mng & Research Dir: George H Beers
MINE, Skagit County, open pit,
Cr
Under devel

200-TON GRAV MILL, Hamilton

(Planning underway)

UTAHCAN INC

1831 E Sprague Ave, Spokane 31
Pres: L L Lorang
VP: Gordon Berthaug
RUSHMEIR LEASE, Pend Oreille
County, Pb, Zn, Ag, Au
Under devel

VICTORY MINES CORP

Lloyd Bldg, Seattle 1
Pres: J F Brand
VP: Joe F Krom
Sec-Treas: The E Dow
KROMONA MINE, Sultan, undergr,
Cu, Au, Ag, WO₃, Mo
Gen Mgr: J F Krom
Met: W H Marquett
Mine Supt: B Y Thorp
Consult Eng: W A Richelson
100 TON FLOT MILL, at mine
Mill Supt: W H Marquett
Under devel

WAR EAGLE MNG CO, INC

312 S 9th St, Yakima
Pres: Russell E Peterson
VP: Virgil L Packer
Sec-Treas: E Walter Peterson
Purch Agt: E W Peterson
11 CLAIMS, Copper Creek Mng dist,
Yakima County, Mo
Under devel
(See Idaho)

WESTERN GOLD MINING, INC

712 Joseph Vance Bldg, Seattle
Pres: Harry Kramer
NEW LIGHT MINE, Whatcom County,
Au, Ag
100-TON FLOT MILL

WESTERN RESOURCES CORP

P O Box 589, First & Main,
Los Altos, Calif
LYONS HILL SILICA DEPOSIT, 9
mi from Springdale, Silica
Prod: 70 tons
(Mine is operated by contract)

WESTERN URANIUM MINES, INC

730 Peyton Bldg, Spokane 1
Pres: William Winkler
VP: William Tanke
Sec & Gen Mgr: Don A Gillis
Treas: E J Minnaugh
Consult Eng: Sam H Richardson
SHERWOOD LEASES, Wellpinit,
Spokane Indian Reservation, open
pit, U₃O₈
SNEVA LEASE, Milan, (Mt Spokane),
WILLMORE LEASE, Wellpinit, U₃O₈
Explor

WIATRAC MNG & DEVEL CO, INC

5002 Ivanhoe Pl N E Seattle
Pres: Paul A Wiatrak
VP: John Sherman
Sec-Treas: John Erickson
COPPER BELL MINE, Goldbar, Cu
Under devel

WIND RIVER MNG CO

205 E 12th St, Vancouver
Pres: Everett N Philpott
MINE, Skamania County, Paradise
dist, Au, Ag
Under devel

WEST VIRGINIA**MEADOWBROOK CORP**

Spelter
Pres: H D Carus
VP: H A Gronemeyer, A C Carus
Sec-Treas: C R MacBrayne
Purch Agt: T S Stuart
RETORT SMELTER, Spelter
Supt: H A Gronemeyer
Asst Supt: T R Ferguson
Prod: 40,000 tons slab Zn yrly

WISCONSIN**AMERICAN ZINC, LEAD & SMELTING CO**

1515 Paul Brown Bldg, St Louis
1, Mo
VINEGAR HILL DIVISION
MINE, Shullsburg, undergr, Zn, Pb
Ile
(See Ariz, Ill, Mo, Ohio, Okla, Tenn,
Tex, Utah, Wash)

CUBA MNG CO

Platteville
Treas: A W Helms
Mgr: J P Lacke
PROPS, nr Mineral Point & New
Digings
Ile

EAGLE Picher CO, THE

MNG & SMELTING DIV
Galena, Ill
Gen Mgr: R L Haffner
Gen Supt: H H Haman
Geol: H Calloway
Met: Albert Thayer
Maint Supt: Tom Ray
Maint Frm: Clarence Lyden
Mine Supt: E L Houy
Mill Supt: C C Crow
SHULLSBURG MINE & MILL,
Shullsburg, Au, Pb
Prod: 1,200 tons
BIRKETT MINE, Hazel Green, Zn
Prod: 500 tons
LINDEN MINE, Linden, Zn
Prod: 300 tons
LINDEN MILL, Linden
Prod: 500 tons
(See Ill, Kans, Nev, Ohio, Okla)

MIFFLIN MNG CO

Box 132, Mifflin
Owner: Herb Turner
COKER, BICKFORD MINES, undergr,
Zn, Pb
Gen Mgr: John F Howland
200-TON GRAV-FLOT MILL
Mill Supt: G H Pett
Ile

MONTREAL MNG CO

Munreal
Gen Supt: C A Bjork
Supt: D S Young
Asst Supt: R H Holgers
Purch Agt: C F Guenther
Master Mech: Leo R Arducant
Elec Eng: James Thomas
Mech Eng: W W Viebahn
MONTREAL MINE, 4 mi W of Hurley,
undergr, Fe
Prod: 3,950 tons daily
(See Oglebay-Norton & Co, Ohio)

NEW JERSEY ZINC CO, THE

Box 217, Platteville
EXPLORATION STAFF
Res Geol: J M Hague
Geol: Wayne Zwickley
(See Calif, Colo, N J, N Mex, N Y,
Pa, Tenn, Va)

NEW TEASDALE MINE

Rt 2, Cuba City
Mgr: George Rooney
MINE, near Benton, undergr, Zn
Ile

PICKANDS MATHER & CO

ODANAH IRON CO
CARY MINE, Hurley, undergr,
Supt: J C Wagnard
Asst Supt: B W Carey, Jr.
(See Mich, Minn)

PIQUETTE MNG & MLG CO

Box 4, Platteville
Mgr: F B Piquette
Geol: Harold Davis
PIQUETTE NO 1 MINE, 15 mi W of
Platteville, undergr, Zn, Pb
Mine Supt: Bernard Murray
Prod: 350 tons
350 TON GRAV-FLOT MILL
Mill Supt: John Knebel

WYOMING**ALJOB MNG CO**

Thermopolis
HOLDINGS, Gas Hills area, Fremont
County, U₃O₈

AMERICAN COLLOID CO

Merchandise Mart Plaza, Chicago
54, Ill
Pres: Paul Bechtner
VP: William D Weaver
Asst Sec-Treas: Jeanette Salmon
Purch Agt: Arthur G Clem
UPTON MINE, Upton, open pit,
bentonite clay
Gen Mgr: Orville Horn
Asst Gen Mgr: Donald Horn
Prod: 250 tons
250-TON MILL, Upton, drying and
grinding
(See Ill, Miss, S D)

ANSCHUTZ DRILLING CO, INC

141 Mile High Center Bldg,
Denver, Colo
FLY GROUP, Converse County,
undergr, open pit, U₃O₈
(See Colo)

ANTELOPE MINES

Box 341, Riverton
Mgr: N P Juneman
MINES, Riverton
Geol: L A Henderson
Under devel

ATLANTIC WESTERN MNG CO

South Pass Route, Lander
DUNCAN MINE, undergr, Au
50 TON FLOT MILL
Under devel

BALL & DITTMER

P O Box 164, Bell Gardens, Calif
Own: Grace D Ball, H W Dittmer
COLUMBUS MINE, Pumpkin Buttes,
Gillette, open pit, U₃O₈, V₂O₅
Ile

BARCO MINERALS INC

Box 432, Sturgis, South Dakota
Pres: Richard B Williams
VP: M H Braden
Sec-Treas: Ruth I Williams
SPOOKY JOE, Hulet, Crook County,
open pit, U₃O₈
Mine Supt: M H Braden
Geols: W J Laug, F R Williams
Under devel

BENTON CLAY CO

P O Box 432, Casper
Pres: Fred Carr
VP & Gen Mgr: I Kreiner
Sec-Treas: Henry Burgess
BENTONITE MINE, Natrona County,
placer
Gen Supt: R E Goering
Geol: Fred Carr
Mech Eng: R E Goering
MILL, Casper

BLACK HILLS BENTONITE CO

Moorcroft
Pres: H T Thorson
Gen Mgr: A C Harding
MINE, Moorcroft & Upton
surface, bentonite
Mine Supt: W A Robinson
Prod: 200 tons
180-TON MILL, drying & grinding
Plant Supt: Boyd Ash

CARBON URANIUM CO

915 S Third St, Laramie
Pres: George Leiber
VP: Charles Walby
Sec: Nina G Downs
Treas: G M Merrick
ALPHA & CHICAGO CLAIMS, Baggs
Explor

COLORADO FUEL & IRON CORP

Sunrise
SUNRISE MINE, undergr, Fe
Supt: M L Sison
Asst Supt: R L Wahl, Jr.
Eng: H B Lynch
Ch Elec: R E Davis
Ch Chem: H A Robb
Mine Frm: A E Testolin
Prod: 3,100 tons
(See Colo, Utah)

CONTINENTAL MATERIALS CORP

820 South 9th, Grand Junction,
Colo
MINES, Crooks Gap, open pit &
undergr, U₃O₈
Gen Supt: Herbert Reynolds
(See Colo, Utah)

COPPER KING MNG CO

COPPER KING MNG CO
Box 521, Cheyenne
Pres: Harry E Ferguson
VP: Andy E Roesdel
Sec: P W Dinneen
Treas: Harry E Ruckman
COPPER KING MINE, 22 mi W of
Cheyenne, open pit, Cu, Au, Ag, Ti
Mine Eng: T L Johnston, (Laramie)
Under devel

CRYSTAL CREEK GYPSUM CO

243 W Main St, Lovell
Pres: Alford Deschenes
VP: Herbert Daniels
Sec-Treas: H M Deschenes
CRYSTAL CREEK GYPSUM MINE,
Crystal Creek and Himes, open
pit, gypsum
Under devel

FEDERAL URANIUM CORP

249 S Main St, Salt Lake City, Utah
Pres: Ralph W Neyman
MINE, Gas Hills, U₃O₈
Under devel

FOUR CORNERS URANIUM CO

P O Box 1749, Grand Junction, Colo
VP: Dr E L Clark
MINE, Gas Hills, U₃O₈
(See Utah and Largo Uranium Corp,
N Mex)

FREMONT MINERALS, INC

517 Farmers Union Bldg, Denver
Exec VP: Allan D Gray
Sec-Treas: W H Hoadley
Prod Mgr: G T Bator
500 TON MILL (Acid-carbonate-
solvent extraction) Riverton
Mill Supt: G H Bryant
(under const)

GLOBE MNG CO

Rox 1188, Casper
Pres: H O Hand
VP: Page T Jenkins
Sec-Treas: H Wayne Ashcraft
Purch Agt: E L Lockhart
GLOBE MINE, Riverton, Converse
County, open pit, U_3O_8
Supt: E L Lockhart
Geol: Richard Bagan
Asst Supt: Charles Perkins
Prod: 40 tons

GREEN RIVER OIL & URANIUM CO

26 W Broadway, Salt Lake City,
Utah
MINE, Gas Hills, Fremont County,
 U_3O_8
Idle
(See Colo, Utah)

HAMLIN EXPLOR & MNG CO

P O Box 437, Edgerton
Pres & Gen Mgr: Wm C Hamlin
VP: Robert G Hamlin
Sec: Clyde H Hamlin
HAMLIN-CONCORD MINE, Edgerton,
surface, U_3O_8 , V_2O_5
Explor Drilling

HOMESTAKE MINING CO

400 Bush St, San Francisco 4,
California
PROPERTIES, U_3O_8
Under devel
(See Calif, N Mex, S D, Utah)

HUGHES MNG CO

520 E Main, Riverton
Owner: Vern Hughes
PAT-N-DILL MINE, Gas Hills, 2 1/2
mi E of Lucky Mt, open pit, U_3O_8 ,
 V_2O_5
Idle
(See Two State Uranium Co, Wyo)

INTERMOUNTAIN CHEMICAL CO, CHLOR - ALKALI DIVISION (Subsidi of FOOD MACHIN & CHEM CORP)

Box 872, Green River
Div Pres: F A Gilbert
Purch Agt: R T Guest
WESTVACO MINE, undergr, irona
Gen Mgr: N E McDougal
Asst to Gen Mgr: R F Love
Gen Supt: J R Jacobucci
Mech Eng: H F Young
Elec Eng: L Ruffini
Process Supt: W C Bauer
Mine Supt: T S Bernstein
Asst to Mine Supt: G R Radomsky
Mine Frm: W F Peters
Mine Eng: W Z Wenneborg
2000-TON MILL, at mine
solution & recrystallization
Mill Supt: R Kvidahl
Mill Frm: R Bruce
(See Barium Prod, Ltd, Calif, Nev & Food Machin & Chem Corp, Calif)

INTERNAT'L MINERALS & CHEM CORP, EASTERN CLAY PRODUCTS DIV

Box 451, Belle Fourche
S Dakota
MINE, Crook County, surface,
bentonite
Mgr & Purch Agt: K L Arthur
MILL, Belle Fourche, S Dakota
(See Ariz, Colo, Fla, Ill, Me, Miss,
N Mex, N C, Ohio, S Dak, Tenn, Va)

KAYE MINERAL INC

Suite 314, Centennial Bldg,
1645 Court Place, Denver 2, Colo
DUBOIS URANIUM I-6, Dabois, U_3O_8
Mine Supt: David Haddenham
Idle during winter

KERR MCGEE OIL INDUSTRIES, INC

Kerr McGee Bldg, Oklahoma City,
Oklahoma
URANIUM Prod
(See Ariz, N Mex, Okla)

LEVI COMPANY

265 E 12th St, Casper
MINE, Gas Hills, open pit, U_3O_8
Mgr: Jack Ellis

LISBON URANIUM CO

310 First Security Bldg,
Salt Lake City, Utah
Pres: A P Kibbe
MINE, at Little Mt, open pit, U_3O_8
(See Monty, Colo, N Mex)

LITTLE MQ MNG INC

Hipton
Pres & Gen Mgr: Allan D Douglas

VP: John Kummerfeld

Sec: Earl Cox
Treas: J E Ackerman
MINE, Shoshoni, 25 mi NE of
Shoshoni, open pit, U_3O_8 , V_2O_5
Geol-Eng: Earl Cox
Supt: Millard Dickey

LUCKY Mc URANIUM CORP

907 Walker Bank Bldg,
Salt Lake City, Utah
Pres: Allen D Christensen
Exec VP: E E Littlefield
VP: Neil McNeice
Sec: Robert Cranmer
Treas: J M Horrigan
LUCKY Mc MINE, Masonic Temple
Bldg, Riverton, 50 mi E of Riverton,
Gas Hills Mng dist, open pit, U_3O_8
Gen Mgr: A V Quine
Geol: Don C Anderson
Mech Eng: Lowe H Morfeld
Met: Robert Porter
Under devel
750-TON MILL, Gas Hills field
column exchange
Under constr
Project Mgr: John S Anderson
Mill Supt: Ian Ritchie
Mine Supt: S A Hottiman
Cons Met: Robert Porter
(Operated by Utah Mng Co)

MAGNET COVE BARIUM CORP

Box 832, Greybull
Div Mgr: Lee Grenier
MINE, 8 mi E of Greybull, surface,
bentonite
250-TON MILL, drying & grinding
Mill Supt: John M Copenhaver

MAGNETITE PROD CORP

Whiteland
Sec-Treas: Parr Merriman
MINE, Albany County, open pit, Fe

NATIONAL LEAD CO, BAROID DIVISION

Osgae
CLAY SPUR PLANT
Mine & Mill Supt: Joe Rosetti
MINE, surface, bentonite
PLANT, dry grinding
COLONY PLANT
Mine & Mill Supt: D K Rowand
MINE, surface, bentonite
PLANT, dry grinding
Supt: J H Loth
(See Ark, Calif, Kans, La, Mo, Mont,
N Y, Tenn, Tex)

OLD FAITHFUL URANIUM CORP

P O Box 166, Ft Collins, Colo
Pres & Gen Mgr: C M Buescher, Jr
VP: Clifford Randall
Sec-Treas: Raymond I Demmick
CARNON BALL MINE, Douglas,
open pit, U_3O_8 , V_2O_5
Asst Gen Mgr: James A Smathers
Mech Eng: J J Malir
Mine Frm: Cal Gurwell
Prod: 50 tons
MINE, Lance Creek area, open pit,
 U_3O_8 , V_2O_5 , selenium
Under devel

PETERSON, RICHARD L

Box 8, Douglas
Part: Bruce Anderson
CERESITE #1 MINE, Douglas, undergr,
Muscovite
Mine Supt & Geol: C J Templin
Under devel

PIVOT ROCK MNG CO

780 37th St, Los Alamos, N Mex
Pres: James H Wearin
Sec: Gordon S Erickson
Treas: Harold G Griffith
MINES, Sec 15, T37N, R73W,
Converse County, surface
Sec 10 & 13, T32N, R90W,
Fremont County, surface

PLUMLEY CONST & MNG CO

Box 588, New Castle
Pres: Ray D Plumley
Gen Supt: Sid Marks
LOST CANYON MINE, New Castle,
undergr, U_3O_8 , V_2O_5
Asst Mine Supt: Charles Plumley
Elec Eng: Randy Wasson
Under devel

PUMPKIN BUTTES MNG & EXPLOR CO

Gillette
Part: Don Wheeler
Pres: J J Hauptmann

COLDSPOT MINE, Gillette, at

Brown Ranch, open pit, U_3O_8 , V_2O_5
Gen Supt: Mel Hansen
Prod: 3 tons

QUAD URANIUM CO

Hulet
Own: James Sheffield, N C McLane,
Ted R Wagner, Wm Phillips
THE QUAD URANIUM MINE, Hulet,
open pit, U_3O_8 , V_2O_5

RUBY COMPANY

Lander & Laramie
(See J R SIMPLOT COMPANY, Idaho)

SAN FRANCISCO CHEMICAL CO

Drawer F, Montpelier, Idaho
LEEFE MINE, 3 mi NW of Sage
surface, phosphate
Mine Supt: Preston S Pugmire
Mine Frm: Frank Duck
Prod: 1,000 tons
(See Idaho, Utah)

SHAWANO DEVEL CORP

1645 Court Pl, Denver 2, Colo
MINE, Baggs, in Poison Basin area
W of Baggs, open pit, U_3O_8 , V_2O_5
Gen Supt: Dean Pospisil
Met: Walter C Spence
Prod: 50 tons

SHIRLEY MOUNTAIN MNG CO

520 E Main, Riverton
Managing Part: S J Stanbury
MINE, Bald Mountain at S edge of
Shirley Basin, open pit, U_3O_8 , V_2O_5

SHONI URANIUM CORP

520 E Main, Riverton
Pres: Vern Hughes
VP: Roy Peck
Sec-Treas: Stanford E Clark
MINE, Gas Hills, open pit, U_3O_8 ,
 V_2O_5
Geol: Bob Ford & L Roush
Under devel
MINE, in E Gas Hills, 45 mi SE of
Riverton, open pit, U_3O_8
Geol: Leigh Roush
Under devel

J R SIMPLOT COMPANY

Executive Office, Continental
Bank Bldg, Boise, Idaho
EXPLORATION for Ruby Company,
Lander & Laramie
(See J R SIMPLOT COMPANY, Idaho)

SODAK URANIUM & MNG CO, INC

Evans Hotel Annex, Hot Springs,
S Dak
Pres: Clyde R Boyle
VP: W E Haldane
Sec-Treas: Paul Russell
D-85 MINE, Converse County, open
pit, Mn
Prod: 23 tons
ALLRAY LEASE & TURNER LEASE
PROP
Explor
(See S Dak)

STANBURY MNG CO

520 E Main St, Riverton
Own: Sam Stanbury
(See Vaca Minerals Co)

SYL DEL MINE

Gillette
Own: William F Ramsey
SYL DEL MINE, Gillette, Pumpkin
Buttes, open pit, U_3O_8 , V_2O_5
Geol-Eng: C M Jepsen
Prod: 30 tons

TWO STATES URANIUM CO

Bountiful, Utah
REDWOOD MINE, Gas Hills area,
 U_3O_8
Prod: 1,500 tons per month
(Co-owner with Hughes Mng Co)
(See Utah)

U S STEEL CORP, COLUMBIA-GENEVA STEEL DIV

120 Montgomery St, San Francisco,
Calif
EXPLOR, West Wyoming, near Lander
(See Alaska, Ala, Calif, Minn, Pa,
Tenn, Utah)

URANIUM CYCLE EXPL CO

Box 624, Aladdin
Pres: C Tenderholt
VP: Fred Hall
Sec: Lawrence Hahnaka
Treas-Purch Agt: W L Jallon

HILMER & YELLOW STUFF MINE,

Box 624, Aladdin, open pit, U_3O_8
Mine Eng: A J Katchers
Prod: 23 tons

VALLEY DEAN CORP

Box 27, Bountiful
Pres: Leeland Epperson
VP: M B Fagen
Sec: Frank C Neilson
Treas: Merlin Neish
REDWOOD MINE, Gas Hills, undergr,
 U_3O_8
Geol: E C Erickson
Prod: 150 tons

VITRO MINERALS CORP

800 W 23rd South St, Salt Lake
City, Utah
Pres: C J Potter
VP: W B Hall
Sec: W H Denne, Jr
Treas: R T Ruder
SATECO PROPERTIES, Fremont
County, surface, U_3O_8 , V_2O_5
Gen Mgr: J O Harsh
Gen Supt: Roy Coulson
Geol: R D Adamson
Mech Eng: G Quigley
Mine Frm: Primo Calabria
Prod: 300 tons
VECA MINERALS PROP, Gas Hills,
Fremont County, open pit, U_3O_8 ,
 V_2O_5
Mine Frm: Harvey Christensen
Under devel
(See Vitro Uranium Co, Utah)

WESTERN ENGR CORP

P O Box 8, Douglas
Pres & Geol: R L Peterson
VP: Bruce Anderson
Sec: B J Peterson
Driller: Virgil Goerke
Asst Driller: John Townsend
PROPERTIES, drilling & explor

WESTERN NUCLEAR CORP

507 W Spruce St, Rawlins
Pres: Robert W Adams
Exec VP: Wendell W Fertig
Sec: Edw A Smyth
Treas: F O'Neil Griffin
Purch Agt: Mary Lou Houghton
Geol: Eric Newman
Mng Eng: R T Brown
SHO-BALL MCINTOSH LEASE,
Crooks Gap, open pit, U_3O_8
(Prod planned by June 1958 - 80 tons
daily)

Under devel
BULLRUSH MINE, Gas Hills area,
open pit, U_3O_8
Prod: 300 tons
FRAZIER LAMAC MINE, Gas Hills
area, open pit, U_3O_8
(Prod planned by July 1958 - 350 tons
daily)
500 TON MILL, Jeffrey City, acid
leach, R F
Mill Supt: J W Joyce
Asst Mill Supt: Marcel Smith

WESTERN STANDARD URANIUM CORP

520 E Main, Riverton
Pres: Vern Hughes
VP: Roy Peck
Sec-Treas: Stanford E Clark
Purch Agt: V Hughes
BOHANZA MINE, open pit, U_3O_8
Geol: Bob Ford
(Prod planned by February 1958 -
100 tons daily)

WESTMINSTER CORP

416-20 1st Nat'l Bank Bldg,
Denver, Colo
Pres: David E Adams
VP: Melvin C Bowles
VP & Treas: T R Llewellyn
Sec: Jim T Holman
WAGSTAFF LEASES, Pumpkin
Buttes area, Campbell County,
 U_3O_8
(See Ariz, Colo, Nev, Utah)

WHYNOT PROSPECTING CO

Wagner, S Dak
Pres: Dick Hinkhouse
Sec: D R Wipf
WHYNOT MINE, Gillette, open pit
Gen Mgr: A R Morse

WYOMING URANIUM CORP

Box 24, Lander
Pres: Hopburn T Armstrong
VP: T R Armstrong
Sec: Beatrice H Armstrong
DRILLING, U_3O_8

IRON ORE SHIPMENTS IN GROSS TONS FROM MINNESOTA, MICHIGAN AND WISCONSIN BY COMPANIES AND MINES FOR 1955, 1956 and 1957

Company Mine	1955	1956	1957	Company Mine	1955	1956	1957	Company Mine	1955	1956	1957
E. C. Bradley & Sons				Halcyon Young Mining Company & E. A. Young, Inc.				Pillsbury-Brown			
Bradley	35,989	34,110	26,074	Minnewas	72,128	71,758	59,822	(Douglas)	21,105	26,809	25,067
Charlson Iron Mining Co.				Ellers	106,685	122,876	86,196	Godfrey U. G.	132,560		
Charlson Con-				Grant			1,306	Plummer	2,191,096	1,782,020	2,106,724
centrator	169,310	108,607		Total	178,813	194,634	147,324	Morris Group		12,006	
Cleveland-Cliffs Iron Co., The				Inland Steel Company				Niles (Douglas)	184,032	58,503	504,619
Athens-				Armour No. 1	209,682	166,702	173,915	Dormer	473,963	255,637	64,250
Bunker Hill	708,341	382,354	399,854	Armour No. 2	106,167	116,485	108,915*	Arcturus Group	672,420	503,928	1,240,543
Cambria-Jackson	339,084	221,031	176,687	Morris	335,940	302,710	295,654	Mariska Extension		101,962	32,059
Cliffs Shaft	644,445	656,485	670,883	Greenwood	81,578	63,241	40,236	Leonida Stockpile	300,103	354,467	341,059
Humboldt	175,534	212,487	179,185	Sherwood	402,947	393,991	452,088	McKinley	11,731		
Lloyd	170,900	76,692	865	Bristol	324,914	300,564	353,280	Union L. O.		15,998	13,110
Mass	620,489	439,853	353,683	Total	1,461,228	1,343,693	1,424,108	Stockpile		1,913	
Mather	2,787,268	2,339,678	2,502,736	Jones & Laughlin Steel Corporation				Franklin		77,729	110,251
Ohio	139,180	122,401	116,701	Hill Annex	721,955	603,162	655,147	Hopewell		3,254	
Tilden	101,437	164,883	192,573*	Hill Annex Rec-				Rouchleau			
Spies	222,994	32,893	724	lamination Plant				Canton (St.			
Agnew-Alworth	214,030	50,796		Longyear	828,255	566,794	417,533	James)	716,446	695,698	650,956
Canisteo	971,349	993,816	467,297	Columbia	777,389	664,937	714,604	Stephens			2,163,954
Hawkins	847,279	800,242	668,667*	Missabe Mountain	50,677	48,850	76,588	Embarras			8,600
Hill-Trumbull	737,149	554,924	690,838	Wentworth	175,656	108,973		Total	35,119,201	29,069,894	33,473,359
Holman-Cliffs	1,070,630	956,648	912,243	Schley	219,402	215,133	80,323	Pacific Isle Mining Company			
Sally			303,960	Pettit	250,857	262,219	549,375	Drew-Croston-			
Wanless	74,092	102,393	76,629	Graham No. 1		16,902*		Syme		27,591	19,497
Marquette Ore			160,625	Graham No. 2		64,782*		Emmett	111,263	1,181	
Co. Pellets		35,000	226,335	Leetonia		21,940		Graham No. 2	75,454	74,782	22,896
Research Lab.				Tracy		405,604		Uno-Kerr Group	181,986*	157,085*	35,986
conc.		865		Total	3,024,191	2,979,296	2,641,326	Missabe Mountain	10,596	14,506	21,583
Total	9,822,221	8,400,790	8,100,485	W. S. Moore Company				North Shiras	8,711	5,401	
M. A. Hanna Company				Margaret	21,997	4,758	20,455	Wacoah	196,239*	153,397	97,296
Canon	238,075	327,487	731,903	Hanna	22,390			Pacific			39,753
Hiawatha	613,709	542,187	661,551	Judson	309,371	258,034	38,459	Alpena L.O.S.P.		7,721	16,753
Homer	459,603	433,354	522,842	Pilot-Annex	91,144	14,366		Bradford		26,553	17,919
Waukega	480,820	503,716	594,936	Pilot	3,225			Chataco		31,583	50,341
Richmond	113,987			Prindle	42,217	7,512		Holland		74,740	14,495
Bray	114,662	556,624	378,789	Prindle Stockpile				Mississippi	46,249	3,555	83,914
Gordon	209,552	640,296	611,483	Yawkey		1,833		Pillsbury Trespass	11,120		
Mesaba Chief	477,727	224,367	25,694	Knox	8,122			Missouri L.O.S.P.	3,743		2,335
Stein	429,679	101,662	332,547	Stubler	27,525	27,140	3,287	Albany			148,172
Enterprise	1,545,634	1,061,892	728,037	Norman		1,307		Commodore Group		243,537*	
Brunt	15,323	15,323	2,835	Gilbert Silver	35,058			Commodore-Union Area			3,948
Buckeye	43,136	50,024	17,871	Alice		23,116	2,422	DM & IR L.O.S.P.			274,595
Impro "B"	106,366		2,882	Graf		2,967	30,015	Iroquois			94,722
Norpac	125,967	29,206	12,917	Mariska		153,303	243,559	Meadow			20,892
Section 18	110,803		333,725	Judson Extension			96,744	Shada			126,201
Leach	64,577	172,453	123,771	Mariska Extension			5,349	St. Paul		218,212	
Duncan	666,348	232,685	336,060	Total	618,561	486,824	457,422	Genoa-Sparta		8,116	
Argonne	20,908		39,431	North Range Mining Company				Sidney		4,683	
Perry	286,100	494,069	216,966	Champion	151,364	137,447	172,029	Stevenson		14,452	24,975
Carls No. 2	466,435	33,643	669	Book	143,038	113,158	100,409	Susquehanna Retreat		12,748	
Harrison	64,558	137,925	25,827	Warner	158,060	186,234	160,251	Victoria			26,605
North Harrison	100,995	84,276	6,209	Leonidas	193,179	137,371	202,125	Winifred			1,403
Harrison B	115,766	127,701	114,144	Penokas	370,438	511,287	514,059	Wisstar			145,963
Halobee	70,814	83,261	140,667	Fortune Lake conc.		2,261		Mangan			
Quinn	398,141	39,611	23,900	Total	1,016,079	1,067,758	1,148,873	ManuWest			75,156
Lot No. 1	46,662			Oglebay, Norton & Company				Airport			883
Olson	520,187	496,519	172,334	Montreal				South Chandler			3,364
Wyman	179,534	183,487	84,146	(Montreal				Wakefield	237,794		140,824
Patrick Ann	129,099	685,565	691,706	Mng. Co.)	1,090,951	855,807	929,998	Meress			49,360
Patrick Annex	67,772	113,308	138,780	St. James				Total Shipments	653,707	1,317,637	1,564,211
Kevin	175,866	76,926	47,578	(St. James	405,235	328,960	433,318	Pickands Mather & Company			
Kevin B	166,597			Canton				Zenith	413,094	355,784	384,924
Patrick B	583			(St. James	716,446		650,956	Erie	189,724	227,994	265,172
Patrick C	48,995			Mining Co.)				Embarras	1,046,434	672,383	726,603
Galbraith	42,368			Total	2,212,632	1,184,767	2,014,272	Biwabik	238,743		
Aromac	101,574	91,104	94,459	Oliver Iron Mining Division				Albany	345,136	321,566	370,927
MacKillican	92,065	458		West Davis-Geneva				Scranton	799,859	529,031	459,095
Wegum	343,256	326,648	266,710	U. G.	670,011	798,223	766,077	Mahoning	2,023,299	1,805,109	1,774,937
Wegum So.				Pioneer U. G.	849,411	208,809	157,405	Carmi	454,703	444,913	356,870
Longyear	91,133		34,770	Soudan	208,344			Bennett	601,778	493,175	468,322
South Agnew	665,380	744,716	669,999	Mountain Iron				Danube	708,207	615,800	606,264
Agnew No. 2	405,634	440,710	404,162	Group	1,115,486	545,952		West Hill	708,071	658,431	658,642
Morton	624,678	379,826	376,066	Rouchleau	5,841,415	5,212,154		Ticonderoga No. 2	405,749	564,517	742,499
Hillcrest Extension	55,109			Group (incl.				Rabblitt Lake	327,770	301,508	303,437
Feigh		203,020	120,590	Sauntry)				Mahomone	455,700	343,753	401,013
Huntington	3,057	34,453	6,718	Sauntry	329,372	1,076,151	579,740	Sagamore	302,263	148,940	124,855
South Hillcrest	112,439	77,966	86,230	Spruce Group	1,496,077	1,224,065	651,746	Cary	684,809	542,525	603,206
Cuyuna Fee	244,110	305,202	193,878	Pilotac	632,195	676,797	664,243	Newport	581,678	528,354	487,055
Section 6	15,121		11,102	Gilbert	2,100,138	2,124,054	2,296,539	Geneva	62,908	466,805	558,340
Louise No. 1	11,421	43,464		Hull-Rust Group	3,755,504	3,282,332	2,592,036	Anvil-Palms-			
Louise No. 2	103,914			Sherman Group	6,382,955	5,727,793	5,951,165	Keweenaw	543,365	489,956	128,597
Fortsmouth	686,238	567,082	512,360	Monroe Group	2,822,454	2,287,916	3,147,100	Sunday Lake	407,222	282,493	390,114
South Yawkey	15,502			Pillsbury	279,309	178,097	258,386	Buck Unit	556,229	422,596	390,084
North Yawkey	270,971	10,787	300,579	Kosmerl	627,395	624,541	758,676	Fortune Lake	375,509	346,816	139,274
Spring Valley	240,418	275,576	111,237	King Group	1,446,676	1,086,114	1,135,029	Cornell		35,305	19,901
Alstead		88,440	11,237	Total	13,075,767	11,165,267	11,066,587	Wade			
Rowe		13,860	15,105	Pioneer Mining Company				Volunteer	111,842	128,810	88,891
West Alpena	6,804	81,294	11,644	Mary Ellen				Loomis	112,478		
Snyder	25,866	68,400		(Conc.)	452,152	315,940	151,605	Lamberton Annex		6,858	
South Ann	94,486			CATALOGUE, SURVEY & DIRECTORY NUMBER, 1958				Lawrence		6,379	
Campbell D	198,965	27,802	10,728					Total	13,075,767	11,165,267	11,066,587
South Alstead	1,715							Pioneer Mining Company			
North Hillcrest	5,495							Mary Ellen			
Central Feigh	235,368							(Conc.)			
Hunner		733,537	1,297,172								
Hunt		345,256	362,802								
South Eddy		299,997	329,155								
East Alpena			33,776								
Gray Reserve			14,032								
Gray Annex											

Company Mine	1955	1956	1957	Company Mine	1955	1956	1957	Company Mine	1955	1956	1957
Republic Steel Corporation				Babbitt Plant*			282,925	Schroeder Mining Company			
Susquehanna	996,926	663,298	604,336	Total Shipments	380,214	3,584,736	5,301,490	Krusger	30,000	74,000	81,540
Stevenson	191,503										
Penokee	13,790			Rhode & Fryberger Company				Snyder Mining Company			
Tobin Group	262,389	190,929	144,085	Boeing	424,441	344,653	268,263	Webb-Sellers	484,991	532,925	418,662
Total Shipments	1,464,810	854,227	748,421	Troy	176,894	152,035	151,418	Whiteside	328,644	383,340	377,867
				Pennington	113,602	5,264	30,843	Shenango	5,600		226,776
				Carlson-Nelson		37,739	69,741	Godfrey			
Reserve Mining Company				Hillcrest Stockpile		46,899		South Tender	2,228		
E. W. Davis Works				Total shipments	715,137	584,592	520,265	Total Shipments	821,463	916,265	1,023,305
Taconite Pellets	380,214	3,584,736	5,018,565								

* Includes tonnage produced for others in trepass operations. 1. Includes 546 tons left in Upper Lake port dock at close of 1956 season. 2. Does not

include 43,806 tons Harvester's Hawkins T. B. fines. 3. Armour No. 2 production hoisted from Armour No. 1 shaft. 4. Mined for Zentell Bros. Inc., delivered to J & L Steel Corp. 5. Mined for

Pacific Isle, delivered to J & L Steel Corp. 6. Includes mines of the Hedman Mining Company, Pittsburgh Pacific Company, and Bradford Mining Company. 7. Includes Uni-Kerr-Lamberton Area.

SHORT TONS OF ORE MINED AND SHORT TONS OF WASTE STRIPPED AT REPRESENTATIVE OPEN PIT MINES IN THE UNITED STATES IN 1954, 1955, 1956, AND 1957

Mine	Company	1954		1955		1956		1957	
		Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped
Utah Copper	Kennecott Copper Corporation	24,079,400	35,856,651	27,740,600	45,710,091	32,321,100	30,657,533 ¹	30,906,335	32,300,817 ¹
Peter Mitchell	Reserve Mining Company	—	—	—	—	—	—	15,512,487 ⁴	—
Morenci	Phelps Dodge Corporation	15,427,147	31,738,176	15,899,410	33,148,792	16,794,287	37,788,263	14,767,611	32,608,512
New Cornelia	Phelps Dodge Corporation	9,128,833	13,730,441	10,274,836	14,663,772	10,112,434	14,504,201	8,813,134	14,014,755
Chino Mines	Kennecott	6,336,058	12,685,603	6,922,950	12,856,067	8,000,001	14,215,786	7,410,927	13,256,722
Benson	Jones & Laughlin Steel Corporation	—	—	—	—	4,603,694	3,370,783	5,110,679	3,624,916
Ray Mines	Kennecott	3,657,673	9,268,105	4,818,358	10,204,329	5,852,742	N.A.	4,751,463	N.A.
Berkeley Pit	Anaconda Company	—	—	921,279	—	2,132,000	15,402,000	4,892,000	19,095,000
Lavender Pit	Phelps Dodge	1,651,311	13,676,967	4,433,218	8,013,961	5,069,049	6,463,378	4,440,768	5,968,164
Copper Cities	Miami Copper Company	996,160	7,257,380	4,004,052	3,347,720	4,167,147	3,869,132	3,482,482	3,037,708
Silver Bell	American Smelting & Refining Co.	—	—	—	—	2,738,650	8,771,600	2,832,600	5,141,480
Liberty	Kennecott	—	—	474,096	613,377	2,369,114	719,378	2,710,093	1,177,977
Eagle Mountain	Kaiser Steel Corporation	1,337,384	2,574,888	2,032,636	3,079,282	2,649,892	4,108,568	2,635,000	N.A.
Jacksonville	Humphreys Gold Corporation	—	—	2,700,000	—	2,920,000	—	2,440,000	—
Pauway No. 4	Davison Chemical Company, Div of W. R. Grace and Company	—	—	—	—	—	—	—	—
Bonny Lake	Davison Chemical	446,000 ²	—	2,373,100 ²	2,598,400 ²	2,315,900 ²	2,683,000	1,979,800	3,219,600
Veteran	Kennecott	459,053 ²	—	1,393,600 ²	4,444,900 ²	1,298,300 ²	5,540,100	1,806,000	4,010,900
Bagdad	Nevada Mines Division	—	8,927,008	75,157	1,060,467	709,136	10,607,535	1,638,249	10,409,322
Pima	Bagdad Copper Corporation	1,312,086	6,636,612	1,344,489	9,175,745	1,261,870	5,909,888	1,479,034	4,584,861
Nickel Mountain	Pima Mining Company	—	—	—	824,000 ²	—	8,849,000 ²	1,133,901	3,119,907
Saline County	Ore Corporation	124,547	—	284,416	—	551,656	—	1,016,596	—
Gay	Aluminum Company of America, Mining Div.	N.A.	N.A.	N.A.	N.A.	779,130 ²	—	834,082 ²	—
Saline County	J. R. Simplot Company	610,604	937,000 ²	791,961	223,678 ¹	755,000	888,615 ¹	830,400	1,368,210 ¹
Conda Pit	Keynolds Mining Corporation	—	—	529,431	1,838,012	496,698	1,519,724 ¹	135,230	789,021 ¹
Van Stone	Anaconda Company	—	—	—	—	189,000	272,000 ²	293,000	642,000 ²
Anderson Pit	American Smelting & Refining Company	355,626	528,182	380,324	620,033	367,441	613,780	200,929	134,721
Centennial	Montana Phosphate Products Company	—	—	—	—	116,038	491,403 ¹	117,546	330,025 ¹
Northgate	J. R. Simplot Company	—	—	—	—	86,909	179,740 ¹	114,034	209,885 ¹
Rattlesnake	Oriskany-Mahoning Company	—	—	—	—	104,737	—	91,462	—
Idaho-Almaden	Continental Materials Corporation	—	—	7,397	—	8,453	2,551,000 ²	58,890	—
Sun Valley Barite	Rare Metals Corporation of America	—	—	—	—	58,101	—	57,836	—
Tungsten	J. R. Simplot Company	—	—	—	—	16,277	30,900 ²	48,957	58,686 ¹
Three Kids	Nevada Massachusetts Company	37,692	382,474	35,056	414,185	27,188	388,080	42,252	300,944
Seismic Pit	Manganese, Inc.	257,532	77,204	393,088	729,420	453,852	3,368,851	30,401	111,567
Getchell	Continental Materials Corporation	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	4,882	105,500
Kimberley	Getchell Mine Inc.	—	—	48,160	255,700 ²	68,860	272,500 ¹	2,230	4,000 ²
San Carlos	Kennecott	N.A.	N.A.	N.A.	N.A.	1,368,143	—	3,879	—
Weed Heights	Nevada Mines Division	—	—	—	—	—	—	—	—
Sanford Hill	New Idria Mining & Chemical Company	—	—	—	—	5,236	—	1,745	—
Iron Mountain	Anaconda Company	3,866,775	6,597,000	3,942,161	7,793,905	4,500,000	N.A.	N.A.	N.A.
Desert Mound	National Lead Company	1,355,952 ²	1,917,433 ²	1,288,617 ²	1,964,553 ²	1,522,197 ²	2,290,380 ²	N.A.	N.A.
Comstock	Columbia Iron Mining Company	975,000 ²	2,633,000 ²	1,268,000 ²	951,000 ²	1,267,000 ²	911,000 ²	N.A.	N.A.
	Columbia	988,000 ²	2,850,000 ²	1,005,000 ²	1,034,000 ²	1,253,000 ²	995,000 ²	N.A.	N.A.
	Colorado Fuel & Iron Corporation	430,651 ²	—	818,279 ²	—	910,949 ²	—	N.A.	N.A.

1. Cubic yards. 2. Long tons. 3. Products sold. 4. Gross tons. 5. Stripping completed in October 1956. 6. Net tons. N.A. Not available.

SHORT TONS OF ORE MINED AT REPRESENTATIVE UNDERGROUND MINES IN THE UNITED STATES IN 1953, 1954, 1955, 1956, AND 1957

Mine	Company	1953	1954	1955	1956	1957
Climax	Climax Molybdenum Company Div., American Metal Climax, Inc.	6,604,857	8,709,900	9,227,700	9,929,000	10,551,000
San Manuel	San Manuel Copper Company	—	—	459,726	5,496,328	8,825,130
Butte Mines	The Anaconda Company	4,230,567	3,701,677	5,211,401	6,017,000	5,087,000
Copper ore		1,323,607	915,134	1,091,862	1,094,000	651,000
Zinc ore		471,642	370,288	388,609	420,074	421,074
Manganese ore		—	—	—	—	—
TOTALS		6,025,816	4,987,099	6,691,872	7,481,000	6,159,000
Southeast Missouri	St. Joseph Lead Company	5,377,405	5,738,700	4,094,221	5,972,884	6,038,785
Miami	Miami Copper Company	3,705,113	3,413,914	3,721,675	3,812,165	3,455,120
Calumet Division	Calumet & Hecla, Inc.	2,009,262	1,939,329	1,406,671	2,060,849	1,731,385
Homestake	Homestake Mining Company	1,368,059	1,485,226	1,550,116	1,627,719	1,659,705
Tennessee mines	American Zinc Company of Tennessee	—	—	—	—	—
No. 2		553,700	533,318	466,962	485,959	488,394
Young		—	—	16,920	222,515	359,415
Grassell		268,934	42,516	163,848	181,959	182,598
North Friends Station		155,683	173,938	118,906	106,504	114,655
Athletic		22,949	8,747	25,339	17,238	0
Coy		—	—	—	—	21,396
TOTALS		1,013,969	758,519	781,975	1,013,663	1,166,458
Cornwall	Bethlehem Cornwall Corporation	—	—	1,737,610 ^a	1,381,281 ^a	1,425,079 ^a
Tri-State Mines	Eagle-Picher Company	—	1,730,696	1,606,974	1,731,851	916,002
Sunrise	Colorado Fuel & Iron Company	603,730 ^a	492,304 ^a	838,692 ^a	725,496 ^a	786,548 ^a
Pend Oreille	Pend Oreille Mines & Metals Company	300,040	482,052	503,591	587,891	757,197
Minnesota Hill	Kennecott-Nevada Mines Div.	—	—	—	390,175	720,768
Illinois-Wisconsin	Eagle-Picher Company	—	229,971	619,011	723,851	679,473
Westvac	Intermountain Chemical Company	—	—	—	596,753	671,652
Copper Queen-Bisbee	Phelps Dodge Corporation	576,658	600,320	546,001	632,088	630,068
All mines	American Zinc, Lead & Smelting Company	—	—	—	—	—
Grandview		234,250	113,502	194,999	209,089	228,352
Nellie B. Division		782,888	880,265	971,175	361,872	148,870
Vinegar Hill Division		—	—	45,912	145,231	91,252
Piquette Joint Venture		—	—	54,046	96,491	91,181
TOTALS		1,020,623	993,767	1,266,133	812,683	559,604
Balmat	St. Joseph Lead Company Edwards Division	—	551,320	539,530	548,167	551,299
Bunker Hill	Bunker Hill Company	407,112	411,900	528,833	531,334	521,041
Tri-State	National Lead Company	—	—	749,024	771,450	502,075
Treasury Tunnel-Black Bear	Idarado Mining Company	260,200	267,250	274,550	480,000	457,850
Magma	Magma Copper Company	431,749	463,915	458,488	453,683	442,134
Reeves MacDonald	Pend Oreille Mines & Metals Company	—	—	—	400,204	405,531
Madison Mines	National Lead Company	—	—	293,165 ^a	355,782	354,764
Shullsburg Unit	Eagle-Picher Company	—	—	—	363,300	337,400
Chromite Ore	American Chrome Company	—	—	—	243,346	251,323
Iron King	Shattuck Denn Mining Corporation	—	—	222,892	254,632	298,104
Gray	Tri-State Zinc, Inc.	279,579	287,842	310,103	278,849	250,749
Graham Unit	Eagle-Picher Company	—	—	—	200,000	207,500
Sunshine	Sunshine Mining Company	249,686	250,698	225,883	200,028	206,385
Star	Hecla Mining Company	228,304	216,877	216,471	189,821	199,020
Saline County	Reynolds Mining Corporation	—	—	180,181	151,874	162,943
Phosphate	Montana Phosphate Products Company	—	325,000	294,971	170,689	171,576
Illinois	Ozark Mahoning Company	—	—	150,324	179,472	151,897
Birkett Unit	Eagle-Picher Company	—	—	—	121,000	136,000
Pago	American Smelting & Refining Co.	153,718	132,656	76,831 ^a	109,586	128,751
Bowers-Campbell	Tri-State Zinc, Inc.	—	—	—	—	127,864
Tungsten	Nevada Massachusetts Company	—	151,557	178,035	185,205	126,243
Galena	American Smelting & Refining Company	0	0	56,489 ^a	87,925	123,129
Edwards	St. Joseph Lead Company Edwards Division	—	—	—	121,788	121,648
Big Buck	Standard Uranium Corporation	—	0	96,538	133,259	92,024
Daisy	Banner Mining Company	—	—	60,097	76,002	91,174
No. 1	Minerva Oil Company	—	—	70,651	66,771	87,127
Day Mines	Day Mines, Inc.	62,841	48,272	95,177 ^a	116,039	84,572
Misra Chest	Banner Mining Company	142,331	120,355	85,084	84,971	82,984
Victory	Minerva Oil Company	—	—	9,746	92,820	62,778
Kailoa	Hecla Mining Company	0	0	3,506	53,605	62,143
Lukachukai Mountains	Kerr-McGee Oil Industries	—	—	40,000	48,000	60,000
Getchell	Getchell Mine, Inc.	—	—	136,100	134,220	54,860
Mineral Hill	Banner Mining Company	—	—	97,464	107,334	51,868
Emperius Mine	Emperius Mining Company	—	—	—	28,643	50,670
Silver Summit	Hecla Mining Company	—	—	—	50,806	50,304
Lucky Friday	Lucky Friday Silver-Lead Mines Company	—	—	—	44,464	40,780
Silver	Clayton Silver Mines	—	—	—	39,901	39,705
Jamestown	Ozark-Mahoning Company	—	—	29,033	32,753	38,378
Morning	American Smelting & Refining Company	96,010	49,468	41,799 ^a	45,946	36,919
Green River	Four Corners Uranium Corporation	—	—	—	26,559	35,373
Austin-Benson	Minerva Oil Company	—	—	—	—	34,186
New Idria	New Idria Mining and Chemical Company	35,486	43,282	36,236	22,517	33,437
Crystal	Minerva Oil Company	—	—	—	58,770	31,789
Amelia	Tri-State Zinc, Inc.	0	0	0	35,089	31,298
Radium Group	Dulaney Mining Company	—	—	—	25,713	23,937
Linden Unit	Eagle-Picher Company	—	—	—	36,531	22,318
Continental No. 1	Continental Materials Corporation	—	—	13,884	18,316	22,319
Cowdrey	Ozark-Mahoning Company	—	—	31,291	24,382	18,005
Largo	Four Corners Uranium Corporation	—	—	—	13,402	16,793
Twin Buttes	Banner Mining Company	—	—	0	6,494	12,284
Crescent	Bunker Hill Company	0	0	10,681	2,411	12,032
Jack Waite	American Smelting & Refining Company	—	9,532	6,753 ^a	—	10,079
Section 10	Kermac Nuclear Fuels Corporation	—	—	—	—	10,000
Uranium Division	Shattuck Denn Mining Corporation	—	—	—	9,229	—
Arizona	Eagle-Picher Company	—	—	—	31,387	7,418
Rattlesnake Incline	Continental Materials Corporation	0	0	0	4,674	5,781
Bull Canyon	Four Corners Uranium Corporation	—	—	4,930	4,025	3,774
Haystack Butte	Federal Uranium Corporation	—	—	—	3,226	3,682
Jefferson	Minerva Oil Company	—	—	—	—	2,668
Oakie	Federal Uranium Corporation	—	—	—	—	2,485
Depression No. 6	Continental Materials Corporation	0	0	0	1,421	2,299
Nevada Scheelite	Nevada Scheelite Div. of Kennametal Inc.	—	—	—	41,273	1,667
Lion Creek	Four Corners Uranium Corporation	—	—	—	2,486	806
White Pine	White Pine Copper Corp.	216,900 ^a	805,356	2,971,000	3,803,760	N.A.
Zinc	Tennessee Coal and Iron Division (U.S. Steel)	—	—	971,175	961,872	N.A.
Hamm	Tungsten Mining Corporation	206,760	297,879	323,996	336,368	N.A.
Scrub Oaks Mine	Alan Wood Steel Company	—	—	283,382	282,311	N.A.

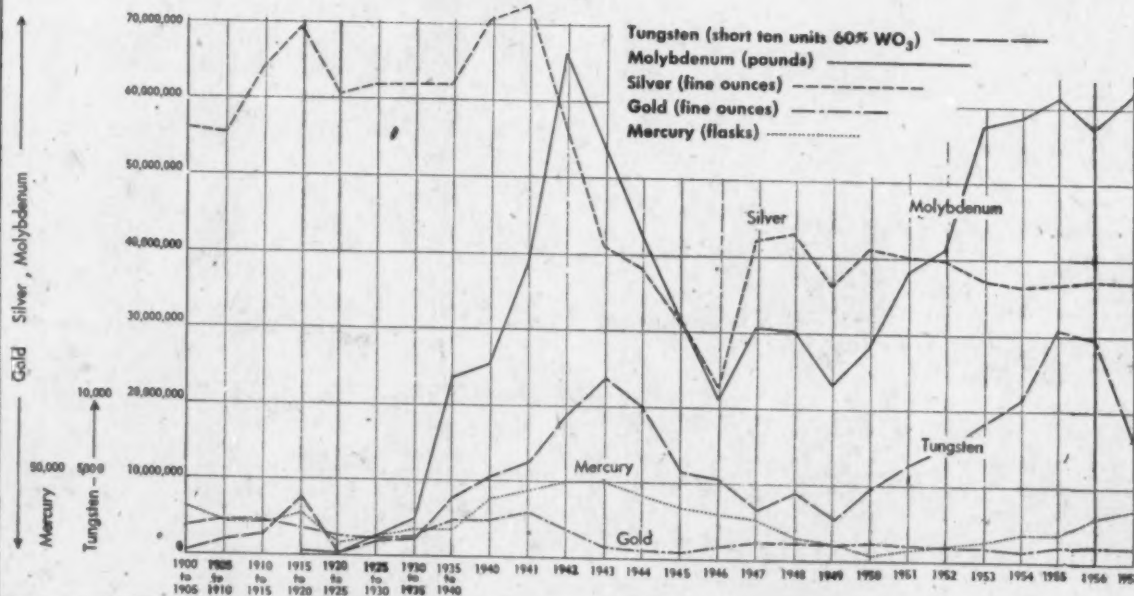
Blackbird
United Mines
Bonanza Utah Mines
Dysart No. 1
Red ore
Zinc mines

Calera Mining Company
United Park City Mines Company
American Gilsonite Company
Rio De Oro Uranium Mines, Inc.
Tennessee Coal and Iron Division (U.S. Steel)
Tennessee Coal and Iron Division (U.S. Steel)

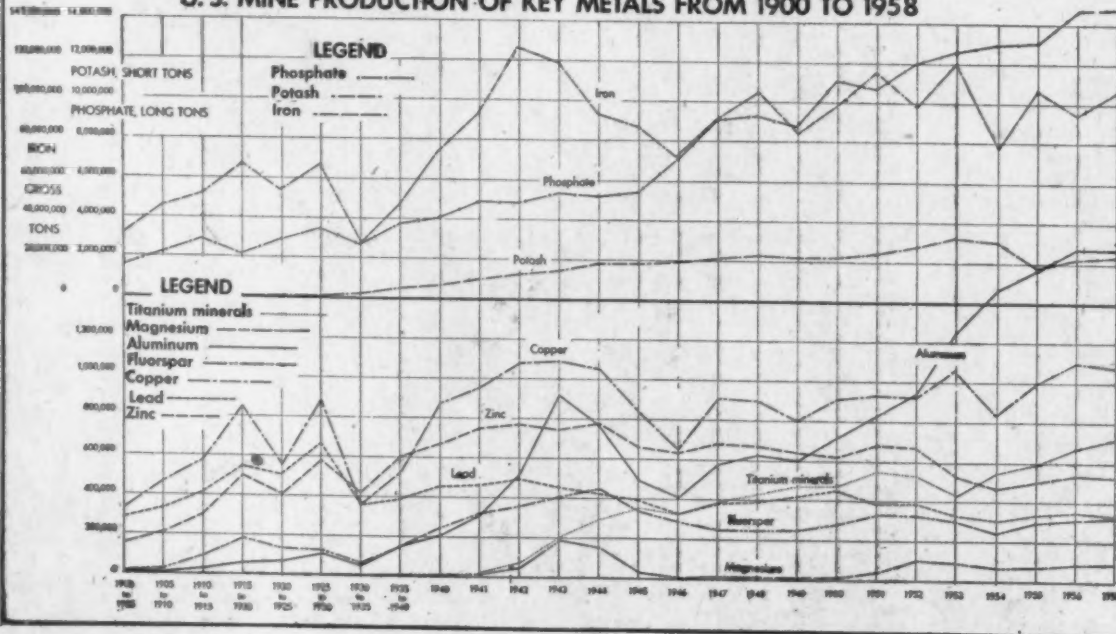
64,574	137,875	176,977	275,724	N.A.
0	19,326	79,364	83,427	N.A.
0	—	53,538	78,349	N.A.
—	3,394,693	3,528,193	18,391	N.A.
—	245,870	388,570	N.A.	N.A.

1. Net tons. 2. Production cut by six weeks strike. 3. Net weight. 4. Production cut by five months strike. 5. Development only. 6. Mine owned by Bunker Hill Company. N.A. Not available.

U. S. MINE PRODUCTION OF KEY METALS FROM 1900 TO 1958



U. S. MINE PRODUCTION OF KEY METALS FROM 1900 TO 1958



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	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72

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Necessary
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San Diego 1, 747 Ninth Ave.	BEImont 4-4684
San Francisco 7, 650 Harrison St.	DOuglas 2-8384
COLORADO	
Denver 4, 655 Broadway Building	CHerry 4-6556
CONNECTICUT	
Hartford, 750 Main St.	CHapel 6-5675
New Haven 10, 265 Church St.	State 7-1176
DISTRICT OF COLUMBIA	
Washington 5, 14th & H Sts., N.W.	EXecutive 3-2800
FLORIDA	
Jacksonville 7, 1628 San Marco Boulevard	EXbrook 8-6441
Miami 32, 25 S.E. 2nd Avenue	FRanklin 9-5691
Tampa 2, 405 S. Morgan St.	3-8371
GEORGIA	
Atlanta 3, 57 Forsythe St., N.W.	JAckson 2-7116
ILLINOIS	
Chicago 3, 135 So. LaSalle St.	FRanklin 2-6480
Peoria 2, Commercial National Bank Bldg.	4-9279
Rockford, 303 North Main St.	3-0664
INDIANA	
Evansville 9, 329 Main St.	HArrison 4-8219
Indianapolis 4, 11 S. Meridian St.	MElrose 2-7415
IOWA	
Davenport, 526 W. Third St.	3-9793
Des Moines, 206 Sixth Ave.	3-8682
KANSAS	
Wichita 2, 114 South Main Street	FOrest 3-9762
KENTUCKY	
Louisville 8, 235 East Burnett Avenue	MElrose 7-5478
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Shreveport 23, 624 Travis St.	2-3274
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Augusta, 209 1/2 Water St.	MAYfair 3-4769
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Duluth 2, 10 E. 821 Marquette Ave.	Federal 3-6455
Minneapolis 2, 821 Marquette Ave.	Federal 3-6455
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Kansas City 8, 1754 Main St.	VIctory 2-0132
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Butte, 81 Hibou Building	2-7341
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Moncton, N. B., 232 St. George St.	EVERgreen 4-9898
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Offices and distributors located throughout the world.

ALLIS-CHALMERS

equipment for the

METALLIC

MINERALS

INDUSTRIES



Allis-Chalmers is the world's largest manufacturer of equipment for the mineral industries. The wide variety of A-C products has brought together one of the most diversified groups of engineering specialists in all industry. That means you can get expert equipment recommendations from A-C.

There's no guesswork when you specify Allis-Chalmers Engineering. The A-C staff, working with your staff, analyzes your problem or process and looks for ways to make existing equipment "team up" with the new equipment for greater production. And the recommendation will be unbiased, because A-C builds many types and sizes of equipment. The selection will be dictated by exactly what you need, not an improvised arrangement.

Trained engineers in the Allis-Chalmers Research Laboratories help solve tough problems by testing samples of your product. This is another precaution to make sure that exactly the right equipment is selected for your particular plant.

And Allis-Chalmers not only builds the basic machinery, but also the motors, drives and control needed to run it—it is the only company that builds all this machinery in its own shops. This means a "packaged" unit or process, with every part engineered to work efficiently with every other . . . assures you of higher efficiencies, lower costs, undivided responsibilities. And Allis-Chalmers stands behind every unit 100%!

ALLIS-CHALMERS

969 South 70th Street, Milwaukee, Wisconsin



27 C 7949E

VIBRATING SCREENS... a complete line

SELECTION GUIDE for metallic minerals industry

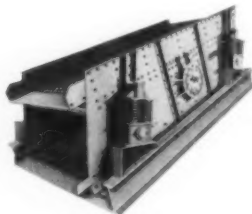
Vibrating Screen Applications	Maximum Feed Size (inches)	Aperture Range (inches)	Screen	Common Sizes (feet)
Scalping—ahead of Jaw Crushers.....	36	3 to 10	ROM Model XXH	5 x 10 to 6 x 14
Scalping—Following primary crushers.....	20	1 to 10	Model XH	4 x 5 to 6 x 16
Scalping—Following secondary crushers or hammermills.....	6	¼ to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing.....	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing.....	5	½ to 2½	Low-Head	3 x 6 to 8 x 20
Dry Sizing.....	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Dry Sizing.....	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Wet Sizing and Washing.....	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Wet Sizing, Washing and Dewatering.....	5	¼ mm to 2½	Low-Head	3 x 6 to 8 x 20
Wet Sizing.....	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Wet Sizing.....	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Media Recovery and Washing.....	8	¼ mm to 2 mm	Low-Head	3 x 12 to 8 x 20
Thickening, Dewatering and Filtering.....	¾	½ mm to 1 mm	Low-Head	3 x 12 to 8 x 20

STANDARD ALLIS-CHALMERS VIBRATING SCREENS

Model XXH ROM inclined screens

For the heaviest scalping problems

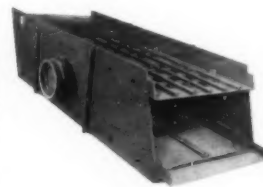
Model XXH ROM screens are of heavy steel construction with balanced, two-bearing cartridge-type mechanism. May be obtained with plate or stepped grizzly bar decks. Max. opening—10 to 11½ inches... 1 or 2 decks. Send for Bulletin 07B8368.



Model XH Extra Heavy Duty inclined screens

For wet or dry scalping and coarse sizing

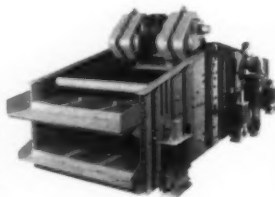
Model XH *Ripl-Flo* screens have balanced two-bearing mechanisms and may be obtained with perforated plate, rod or stepped grizzly bar decks. Max. opening—10 inches... 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.



Low-Head Heavy Duty horizontal screens

For moderate to heavy sizing, coarse to fine, wet or dry, thickening dewatering, media recovery and rinsing.

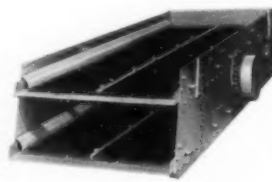
Low-Head screen operation saves headroom and space. Conveniently mounted mechanism imparts a straight line motion to screen. Max. opening—2½ inches... 1, 2 or 3 decks. Send for Bulletins 07B6330 and 07B7868.



Model SH Standard Heavy Duty inclined screens

For moderate to heavy sizing, coarse to fine, wet or dry, light scalping and rinsing

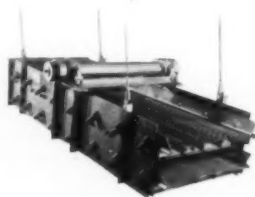
Model SH *Ripl-Flo* screens have balanced, two-bearing mechanism and are designed for a wide range of applications. Max. opening—5 inches... 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.



Model AVS Standard Duty inclined screens

For fine sizing, wet or dry

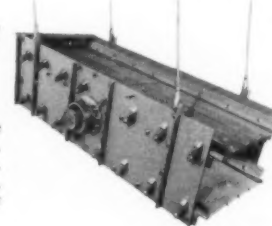
Model AVS *Aero-Vibe* screens have two-bearing mechanism located above the body. Gives top screening efficiency at lowest possible cost. Max. opening—1½ inches... 1, 2 or 3 decks. Send for Bulletin 07B6099.



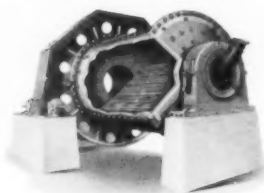
Model S Standard Duty inclined screens

For moderate, wet or dry sizing

Model S *Ripl-Flo* screens are sturdy, low cost screens... have two-bearing mechanism. Max. opening—3 inches... 1, 2 or 3 decks. Send for new Bulletin 07B8229.



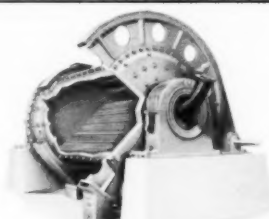
GRINDING MILLS . . . all types



Overflow Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. Rod mill product can be varied from 6 to 35 mesh, with a minimum amount of fines. Because a rod mill can reduce a one inch slot size feed, it has supplanted the last stage of crushing in many plants. The screening action of the rods within the mill produces an ideal ball mill feed, free from tramp oversize, without the use of close circuiting screens.

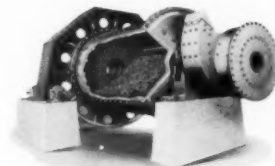
Bulletin 07B6718.



Peripheral Discharge Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. The peripheral discharge rod mill was developed for those dry grinding circuits where close control is required for either the product top size or the fines. In addition to these dry grinding applications, either the end peripheral or the center peripheral discharge rod mill may be used in wet circuits where specific product requirements must be met.

Bulletin 07B6718.



Ball Mills

Sizes 3 to 13 ft diameters, 3 to 17 ft lengths. For producing a finely ground product of 28 to 325 mesh from a feed size of about ½ inch. Ball mills are unsurpassed for the fine grinding of moderately to extremely abrasive materials.

Overflow type ball mills are used for fine wet grinding in closed circuit with a classifier. Diaphragm type ball mills are universally used for fine or coarse, wet or dry grinding in closed circuit with a classifier, screen or air separator.

Bulletin 07B6718.

PYRO-PROCESSING EQUIPMENT

ROTARY KILNS . . .

For sintering, nodulizing, pelletizing, agglomerating, calcining

AIR QUENCHING GRATE COOLER

CONVERTERS

BALLING DRUMS

ROTARY COOLERS, DRYERS

HOLDING FURNACES

WASHING EQUIPMENT

CONTINUOUS CONTACT COLUMN

BLADE MILLS

LOG WASHERS

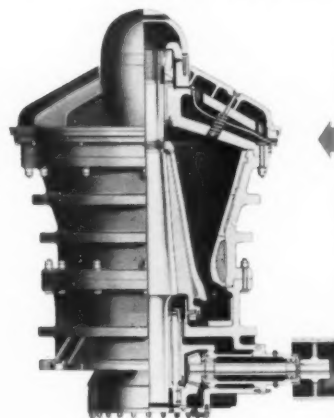
MATERIALS HANDLING EQUIPMENT

CAR SHAKERS

TRACTORS AND GRADERS

MOTOR WAGONS

CRUSHERS FOR EVERY MINING JOB



Superior Gyratory Crushers

For high capacity primary or secondary crushing

Twelve sizes . . . 16-50 to 60-109 (60 inch feed opening, 109 inch diameter cone at crushing point). Capacity 170 to 3500 tph. Available with *Hydroset* mechanism or spider suspension.

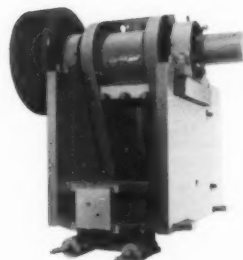
Bulletin 07B7870.

Hydrocone Gyratory Crusher

For high capacity secondary or tertiary crushing

Twenty-one sizes . . . 122 to 1784 (17 inch feed opening, 84 inch diameter cone at crushing point). Capacity 7 to 1050 tph. Equipped with *Hydroset* mechanism. Bulletin 07B7145.

The *Hydroset* mechanism adds flexibility to gyratory crushing . . . an hydraulic mainshaft support which compensates for wear, adjusts product size and facilitates clearing of crusher in case of power failure or unexpected shutdown.



Model ST Jaw Crusher

For crushing moderately hard material with minimum fines

Five sizes . . . 18x30 to 42x54 inch feed openings. Capacity, 75 to 650 tph. Bul. 07B8595.

A-1 Jaw Crushers

For primary crushing of tough, abrasive material in blocky feed sizes

Four sizes . . . 36x25 to 60x48 inch feed openings. Capacity, 200 to 660 tph.

Bulletin 07B6369.

Blake Jaw Crushers

For moderate capacity crushing of hard materials

Five sizes . . . 10x7 to 30x18 inch feed openings. Capacity, 6 to 90 tph. Bulletin 07B7090.

Fine Reduction Jaw Crusher

For crushing 7 inch and smaller feed to 50% passing ¼ inch in one operation

Two sizes . . . 18x9 and 24x10 inch feed openings.

Bulletin 07B6425.

Roll Crushers

For fine crushing of hard material with minimum fines

Double-roll crushers are driven by large flywheel sheaves. Roll diameters from 9 to 78 inches. Bulletin 07B6180.

For crushing large tonnages of laminar rock

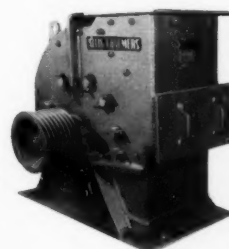
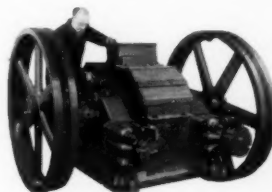
Single roll *Fairmount* crushers, two sizes . . . 24x84 and 36x60 inch rolls. Write for more information.

Pulverator Hammermill

For pulverating non-abrasive materials

Hammers reduce material by multi-impact . . . large ratio of reduction. Handles up to 4 inch feed. Five sizes . . . capacity 2½ to 125 tph.

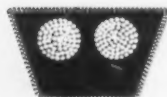
Send for Bulletin 07B6265.



A DRIVE FOR EVERY MACHINE

Texrope—greatest name in V-belt power transmission—is the registered trademark of Allis-Chalmers, originator and pioneer of multiple V-belt drives.

Ask for Bulletin 20C6051, "Handy Guide to Selection of Texrope Drive Equipment"; it tells the complete Texrope Drive story . . . V-belts . . . sheaves . . . and how to figure a Texrope drive.



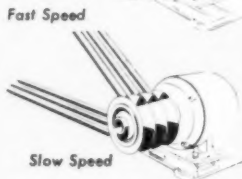
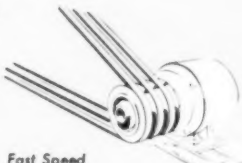
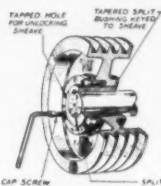
Grommet Belt



Wide Range Belt

Texrope V-belts

Famous patented grommet construction provides longer life than ordinary V-belts. Made with straight sides for greater grip. Types for all operating conditions: heat-resisting; oil-resisting; static-resisting and special High Capacity. Also available: Texrope wide range V-belts for use with wide range Vari-Pitch sheaves and Vari-Pitch Speed Changers.



Magic-Grip Sheaves

The Magic-Grip cast iron sheave provides fast, easy mounting and demounting. Construction is simple, foolproof. Sheave automatically adjusts itself to slightly oversize or undersize shaft. Positive clamp fit on shaft means no weaving—no vibration. There is no back lash—no extra play. Sheave can be mounted closer to motor or machine—reducing strain and stress. Result: bearing pressure eased—bearing life increased.

Stock sizes for drives up to 200 hp. Larger sizes available on order.

Vari-Pitch Sheaves and Speed Changers

VARI-PITCH SHEAVES are available in two types; Standard Range for A, B, C, D or E belts—capacities from 1 to 300 hp—speed variations up to 40%. Wide Range for Q and R belts—capacities from 1½ to 40 hp—speed variations up to 100%. Both types designed with stationary or motion control features—Stationary Control for infrequent changes when sheave is stopped; Motion Control for repeated speed changes while sheave is in motion.

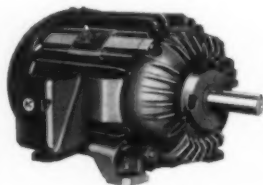
Vari-Pitch Speed Changers furnish 3¼ to 1 speed ratio in one compact, enclosed unit. Adjustable while in motion. Combines two wide range, worm gear-adjusted sheaves. Manual or pushbutton control.

MOTORS FOR EVERY DRIVE

Allis-Chalmers builds a complete line of polyphase squirrel cage, wound rotor, synchronous, and direct current motors with electrical and mechanical modifications to meet any application. Ask for Bulletin 51C6052, "Handy Guide for Quick Selection of Electric Motors"; it furnishes you with enough facts on Allis-Chalmers motors to enable you to select the type which meets your required electrical and mechanical specifications. The next time you need an electric motor, contact your nearby Allis-Chalmers representative.



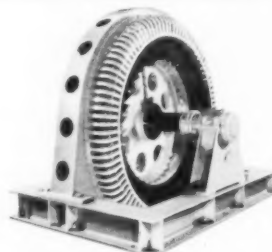
DRIP-PROOF—New NEMA rated squirrel cage motors are available in standard ratings starting at ½ hp. Their better protection against foreign matter helps keep maintenance costs low. Bulletin 51B6210.



TOTALLY ENCLOSED FAN-COOLED—Ideal for dirty, dusty, oily, humid, corrosive, and outdoor locations. Rapidly moving air from the cooling fan keeps most dirt from settling on motor. Easily cleaned. 51B7725.



WOUND-ROTOR MOTORS—For constant speed duty requiring frequent reversing or starting under heavy load. Adjustable-varying speed loads. High starting torque applications, such as crushers, kilns, blowers. 51B8195.



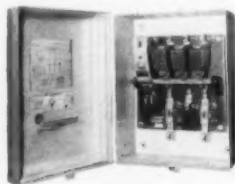
SYNCHRONOUS—Built in ratings from 40 hp up for a wide variety of speeds, including 3600 rpm motors in the larger sizes. Have high efficiency. Improve plant power factor for reduced power costs. 05R8183.



WEATHER-PROTECTED—Design simplicity and the ability to operate under the most severe weather conditions are combined in this weather protected motor. Sizes from 250 hp up. Bulletin 51B8606.

CONTROL FOR EVERY MOTOR

Allis-Chalmers makes a line of starters to meet practically all motor control needs. Count on this wide range of starters, backed by industry-wide application engineering experience, for the answer to your control needs. Ask for Bulletin 14R7988.



Power Distribution

Allis-Chalmers also supplies a complete line of power distribution equipment to mining plants. This includes power, distribution, and instrument transformers; indoor and outdoor switchgear and unit substations; circuit breakers; power rectifiers.

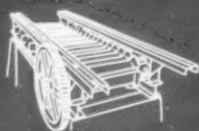
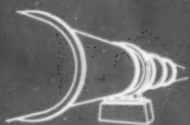
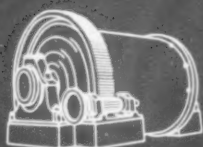
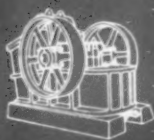
Tractor Equipment

Allis-Chalmers has geared its development progress to the earth moving and material handling needs of the mining industry and is supplying crawler tractors, tractor shovels, pull scrapers, motor scrapers, motor wagons, motor graders, and power units.

ALLIS-CHALMERS

969 South 70th Street, Milwaukee 1, Wisconsin

LITHO IN USA



TRAYLOR . . . a name known to the mining industry throughout the world for producing machinery designed to deliver maximum production at the least possible operating cost year in and year out. For over half a century Traylor machines have been in daily use by hundreds of operators, demonstrating time and again Traylor engineers build the very best in mining machinery.

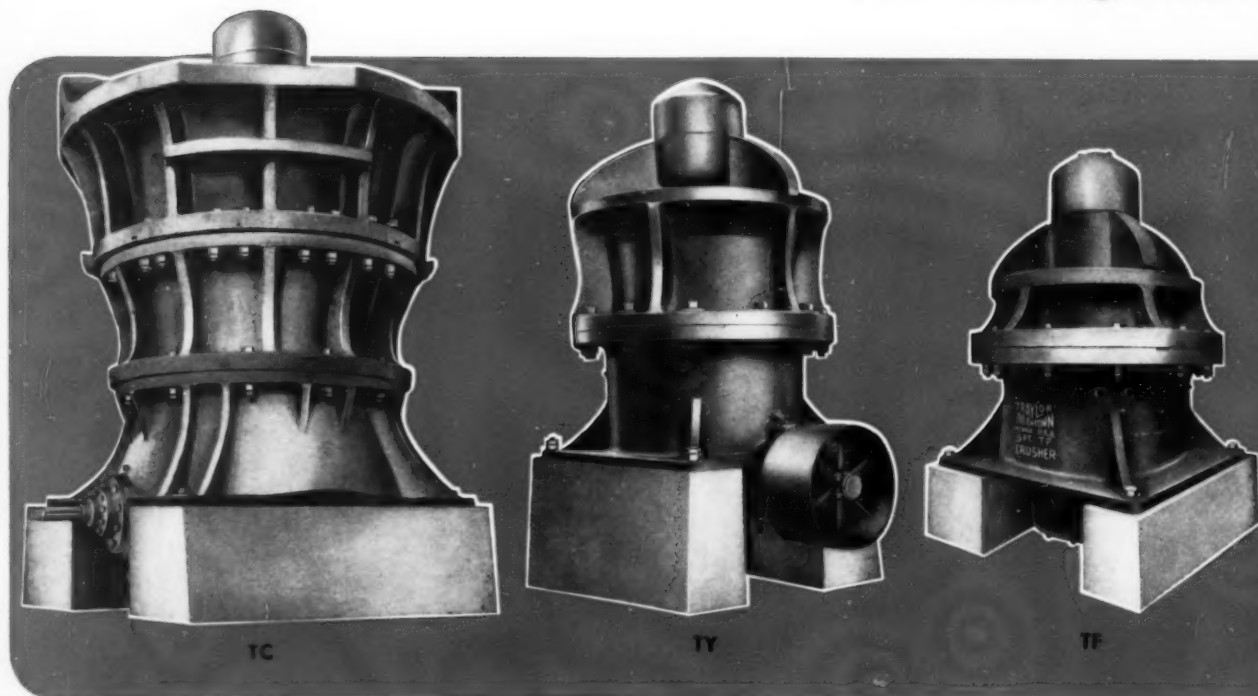


TRAYLOR ENGINEERING & MANUFACTURING COMPANY
ALLENTOWN, PENNA., U.S.A.



CRUSHING

offers the operating
TRAYLOR CURVED
An original



PRIMARY Crushers

Traylor Bulldog Gyratory Crusher Type TC is the most advanced design of large capacity gyratory crushers. Built in six sizes with capacities ranging from 245 tons of a 2" product to 4100 tons of an 11" product, these gyratories feature Traylor original non-choking, self-tightening bell head and curved concaves. Massive construction provides for shock absorption and at the same time all parts are readily accessible for maintenance. The Traylor patented dust seal provides a practical and efficient device for excluding dirt from the lubrication chamber. These are just a few of the features of the Traylor TC Gyratory Crusher—features you want in your crushing machinery.

SECONDARY Crushers

Traylor makes two types of reduction crushers: the TY in six sizes from 1'-3" to 5'-6" with feed openings from 3" to 22", and the TF Fine Reduction Crusher for operators whose needs demand economic production of 5/16" to 1-1/4" material in large capacity. Both of these crushers require less head room due to compact, simplified design. Traylor original curved concaves and self-tightening bell head are used in the TY and TF Crushers. The design, construction and operational features embodied in these reduction crushers are the direct result of Traylor's long and diversified experience and leadership in the ore and stone crushing field.



NEW YORK: 3416 Empire State Bldg.

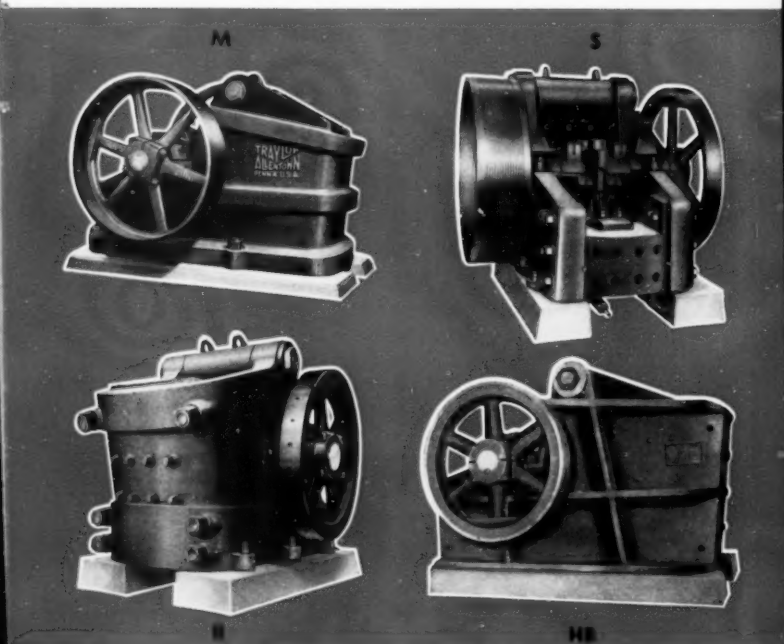
CHICAGO: 1213 Fisher Bldg. 343 S. Dearborn St.

SAN FRANCISCO: 425 Market Bldg. 25 New Montgomery St.

FOREIGN SALES AGENCIES: Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro,

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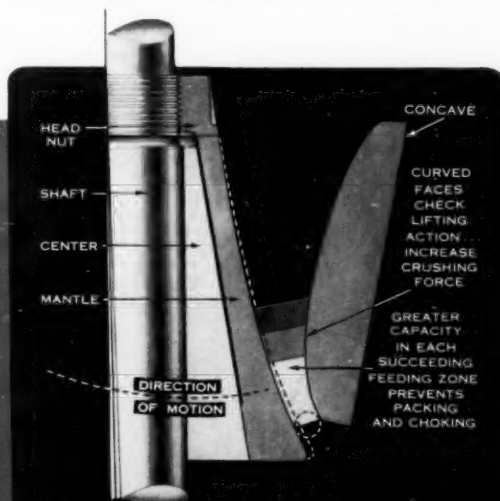
efficiency and economy of
CRUSHING SURFACES . . .
Traylor development



JAW Crushers

As a result of Traylor's many years of experience in building crushers, they have developed one of the most advanced groups of jaw crushers made. Traylor Jaw Crushers are built in five types with 18 different size feed openings. Capacities range from four tons of 7/8" material to 1,000 tons of 11" material per hour. The five types of Traylor Jaw Crushers are H, HB, M, R and S. All of these five machines are precision built to perform their rugged task efficiently.

Traylor's patented swing jaw suspension and originally developed curved jaw plates account for greater capacity at finer settings and longer life of jaw plates. Traylor's curved jaw plates will outwear ordinary plates as much as 3 to 1. All frames are reinforced at critical points to provide strength without excessive weight. For more information on Traylor-Made Jaw Crushers, state your requirements and a bulletin will be forwarded to you immediately.



Curved crushing surfaces, an original Traylor development, are shaped so that the faces are opposed to the direction of motion. Power requirements are reduced, even at finer settings, because more of the power applied is used as a direct crushing force.

By increasing the capacity of each succeeding feeding zone in the crushing chamber, choking and packing are practically eliminated.

AUSTRALIAN MANUFACTURER: Jacques Bros. Richmond S-1, Victoria, Australia

CANADIAN MANUFACTURER: Canadian Vickers Ltd. P.O. Box 550, Place D'Armes Station, Montreal, P.Q. Canada

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Other fine Traylor-Made Products in use by the mining industries throughout the world.



TRAYLOR CRUSHING ROLLS are built in three types—the Four Tension Rod type capable of delivering large capacities and standing up under the most severe, continuous service. Type AA and A Rolls are designed for lighter service. The range in size of the three rolls is from 18" dia. x 10" face to 78" dia. x 24" face with tension springs to develop pressures up to 30,000 lbs. per lineal inch of roll face. Write for bulletin #6637.

TRAYLOR CASTING MACHINES are built in two types: Circular and Straight Line. The Circular Casting Machine is heavily proportioned, driven by two motors through separate gear trains but with a single control and is designed to run in either direction. The track is conical, and the turn-table supporting the mold platform runs on flanged conical rollers. Traylor Casting Machines have been built in sizes up to 40'-0" and can be designed for anode, cathode, wire bar or pigs. Write for additional information.

TRAYLOR MANUFACTURES four types of feeders specially designed for application in the several steps of crushing, grinding, drying or calcining. These four types are the Sheridan Grizzly Feeder, the Apron or Pan Feeder, the Table Feeder and the Slurry Feeder. Grizzly Feeders are made in sizes from 3'-0" x 6'-0" to 10'-0" x 20'-0" and Apron Feeders in widths of 30" to 84" in any length required. All Traylor Feeders are adapted to the size and kind of material to be handled and are easily adjusted to vary their rate of delivery of material. For more on Traylor Feeders, write for bulletin #2114.

TRAYLOR ENGINEERS have pioneered and developed some of the outstanding features used in kiln manufacture. One of the improvements made by Traylor engineers is the design and perfection of the easy aligning, single roller supports used on Traylor Rotary Kilns, Coolers, Dryers and Slakers. The "full-floating" type of tire is another Traylor Kiln advancement. For details on Traylor Kilns, Coolers, Dryers and Slakers, write for bulletin #1115.



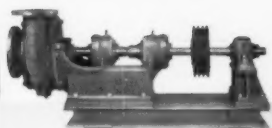
TRAYLOR ENGINEERING & MFG. CO., 1014 MILL ST., ALLENTOWN, PA.

Sales Offices: New York — Chicago — San Francisco

Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P. Q.

Mine and General Purpose Pumps

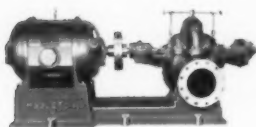
Type
"CA"



100-1000 G. P. M. 50-200 FT. HEAD 100 HP

A sturdy single-suction volute pump for handling small capacities at high efficiency. All ball-bearing construction. Renewable suction and discharge heads. Built for either direct drive thru flexible coupling, taper bored for easy removal, or for V-belt drive. Pulley overhanging or on extended shaft with outboard bearing, mounted on cast iron or structural steel bed-plate. Pump end furnished in cast iron, bronze or stainless steel.

Type
"DS"



200-15,000 G. P. M. 20-400 FT. HEAD 1000 HP

These double-suction pumps are heavily built for severe service. A sleeve type main bearing and a ball thrust bearing are standard construction but all ball-bearing construction can be furnished. Shaft is protected by heavy cast bronze or chrome sleeves. Pump-half coupling is taper bored. All sizes have renewable casing and impeller wearing rings. Split glands. Pump end furnished in cast iron, bronze or stainless steel.

Type
"DS-2"



1000-10,000 G. P. M. 300-700 FT. HEAD 2000 HP

In this two-stage double-suction pump, the water flows thru a Y-pipe into two single-suction impellers which discharge into a centrally located double-suction impeller. Both stuffing boxes are therefore under inlet pressure, an important feature, since high-pressure stuffing boxes can be very troublesome, especially when acidulous water is pumped. The double-suction design permits higher speed for high suction lifts and provides perfect hydraulic balance.

Type
"DSS"



500-4500 G. P. M. 200-500 FT. HEAD 600 HP

The "Sinker" was developed to de-water flooded mine workings. It is a powerful, reliable unit which operates from zero to maximum head without noise or vibration. An inflexible steel frame keeps pump and motor in alignment. The unit can be arranged for running on a track or for vertical mounting on a mine cage or for suspension from a hoisting rope. Built-in strainer straightens out turbulent flow and insures smooth operation.

Type
"MS"



150-7000 G. P. M. 100-1500 FT. HEAD 1250 HP

Originally developed by "HAZLETON" engineers, multi-stage opposed impeller volute pumps have become standard for high head pumping. The Type "MS" pumps consist of a series of two-stage casings with impellers arranged "back to back" and assembled as two-stage, four-stage or six-stage units. The individual two stage casings can readily be cast, are very strong and the replacement cost is low. Ruggedly designed for severe mine service. Complete lines available in 1200, 1800 and 3600 R.P.M. units. Can be furnished in cast iron, ductile iron, bronze or all stainless steel.

Type
"MSH"



100-900 G. P. M. 200-600 FT. HEAD 150 HP

A new compact high-speed (3000 to 3600 R.P.M.) two stage opposed impeller volute pump for low capacity and high head service. The high-pressure stuffing box, which is at first stage pressure, faces the outboard bearing and is readily accessible. Mounted on an "inflexible" steel frame. These units are excellent for small mines. They are available in cast iron, bronze, or stainless steel.

Vertical Mine & Solids Handling Pumps



Type "VS"



Type "VN"



Type "VMS"

TYPE "VS" 100-6000 G. P. M. 25-450 FT. HEAD 800 HP

Embodying the famous Hazleton "Twin-Volute"***, this top-suction vertical pump is excellently adapted for handling clear water as well as slush and solids. Clear water pumps are fitted with a floating Tee-shaped impeller seal ring. Slush-pumps have an adjustable seal-ring and a shaft-enclosing tube for feeding clean water to the pump-bearing.

The "Twin-Volute"*** provides balanced side thrust and assures long bearing life. The pump has no stuffing box at either pump end or discharge head. Discharge head contains thrust bearings so standard solid-shaft motor can be used. Intermediate bearings are available to extend length to 50' or more. Intermediate bearings can be either water or oil lubricated.

TYPE "VN" 50-2500 G. P. M. 25-150 FT. HEAD 150 HP

The complete line of "VN" pumps incorporates all of the fine features of the "VS" pumps and in addition provides a cast ball-bearing housing which rigidly supports the shaft so that cantilever construction can be used. Thus there is no bearing under water. Excellently suited for medium recirculation and froth handling since there is no stuffing box and no bearing lubricating water. Cantilever shaft design limits the length of these units. V-belt drives are available. Can be furnished in any machineable alloy. Special 3600 R. P. M. units available for shaft sinking work.

TYPE "VMS" 600-5000 G. P. M. 300-800 FT. HEAD 1250 HP

The exclusive "Twin-Volute"*** design has been incorporated with another HAZLETON first—opposed impeller design to provide a unique 2-stage vertical pump. It has both lateral and vertical hydraulic balance. Floating "Tee" rings and a self-contained thrust bearing eliminate critical adjustment worries. Trouble free operation is assured by absence of a stuffing box. Intermediate bearings, suitable for water or oil lubrication, are available. Ideal for "between level" pumping underground, or for use on a barge in deep open pit mines.

TYPE "VD" 2000-10,000 G. P. M. 200-450 FT. HEAD 1250 HP

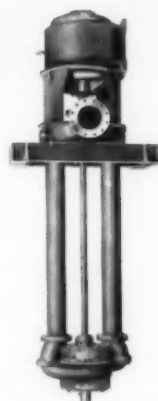
These pumps are similar to the "VS" except that double suction design is utilized for high capacities. Available in both fresh water and solids handling designs. Solids handling units have adjustable rings on both sides of the impeller. These units are ideal for recirculating water service where small amounts of abrasive solids are carried by the water. Available up to 100 ft. in length. No stuffing box. Fully accessible line and pump bearings.

TYPE "P" 25-100 G. P. M. 10-50 FT. HEAD 2 HP

An exceptionally well built all bronze and stainless steel (or all stainless) pump for clean-up service in small mills. Available in three sizes, $\frac{3}{4}$, $1\frac{1}{2}$ and 2 HP. Handles any solids which pass through the $\frac{1}{2}$ -in. strainer holes. Lubricating water externally supplied. Intermediate bearings can be provided to extend length to as much as 20 ft.

TYPE "H" and "PE" PORTABLE PUMPS

The pump end of these units is identical to that of the Type "P" pumps except that the bearings are self-lubricating. Designed for portable service, they are available with totally enclosed $\frac{3}{4}$, $1\frac{1}{2}$ and 2 HP motors in single and 3 phase A.C., and for direct current. Explosion proof, U. S. Bureau of Mines Permissible units are available in $\frac{3}{4}$ HP 230-250 V.D.C. and 550 V.D.C. The latter units have built-in starting switches with overload protection. (See cut).



Type "VD"

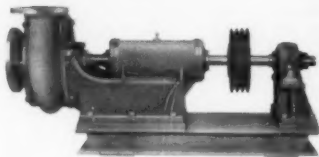


Type "P"



Type "H" & "PE"

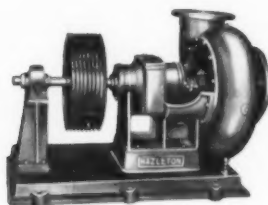
Horizontal Solids Handling Pumps



TYPE "HR" 50-1000 G. P. M. 20-100 FT. HEAD 40 HP

A heavily constructed open-impeller pump for general service. Casing and casing head are bolted to a substantial yoke cast integrally with the bearing housing. Two double-row ball-bearings support the shaft. The part of the shaft passing thru the stuffing box is protected by a heavy cast bronze or chrome sleeve. Motor-driven pumps have flexible couplings. Pump half is taper bored to permit easy removal. Belt driven pumps furnished with extended shaft and out-board bearing. Bed-plates are either of cast-iron or structural steel.

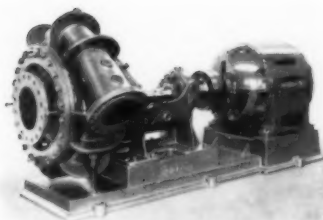
The pump can be furnished with a special bearing and shaft so constructed that the shaft with impeller can be adjusted to take up impeller wear.



TYPE "CB" 100-10,000 G. P. M. 20-150 FT. HEAD 150 HP

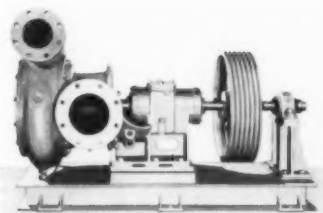
A highly efficient closed impeller pump, ruggedly built for handling low and medium percentages of solids.

Suction and discharge heads are removable and the casing can be used for R. H. or L. H. assembly. Casing is bolted to a heavy yoke. The weight of casing and piping is carried by two heavy supporting-bolts, screwed into the bed-plate. Shaft with impeller can be conveniently adjusted for wear of the impeller ring. This insures longer life of casing and impeller rings. Delivery of water remains at original rate until impeller is worn out. Pumps are built for direct motor drive or for belt drive on extended shaft, supported by out-board bearing. Bed-plates are of cast-iron or structural steel.



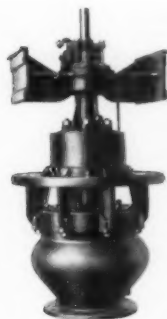
TYPE "CT" 500-6000 G. P. M. 20-150 FT. HEAD 350 HP

A highly efficient heavily built pump for severe solids handling service. Removable suction and discharge casing-heads are protected by wearing plates held in place by T-head bolts. Weight of casing and piping is carried by two heavy supporting-bolts. The yoke, carrying the casing, is mounted on a substantial base-plate. The yoke and complete bearing assembly including impeller, outboard bearing and sheave, can be withdrawn as a unit without disturbing suction or discharge piping. All internal parts can also be taken out by removing suction piping and casing head. The shaft can be adjusted for impeller wear without changing position of sheave. Glands are split. Pumps can be furnished for V-belt or direct drive. All Ni-Hard or Chrome iron wetted parts.



TYPE "TS" 50-3000 G. P. M. 20-150 FT. HEAD 150 HP

The construction of these pumps is similar to the Type "CB" pumps but the position of the impeller is reversed and the water enters from the stuffing box side. The stuffing box is therefore under inlet pressure. The impeller can be conveniently inspected by merely removing the casing head. Ring clearance is easily adjusted to compensate for wear. The exclusive "Kleerseal" stuffing box, which seals effectively at all times without diluting the pumped mixture, makes this the ideal medium recirculating pump for heavy density systems. Available in cast iron, chrome iron fitted construction; all chrome iron; or in sizes 6" and larger, with Ni-Hard casing, wearing plate, casing ring and impeller.



TYPE "VSC" 50-3000 G. P. M. 15-40 FT. HEAD 50 HP

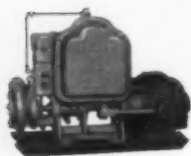
This "Classifier" pump is an excellent example of the specialized equipment designed and built by "HAZLETON."

The pump is installed in a Hydrotator classifier. The liquid is drawn into a top-suction impeller and is discharged into a series of rotating agitator arms attached to the discharge pipe. Pump and agitator mechanism are suspended from a spherical bearing which permits the whole assembly to sway slightly and to rotate. The weight of the impeller and the hydraulic thrust are carried by a double row ball bearing. The rubber bearing supporting the pump shaft is lubricated by clear water, fed into a well, surrounding the bearing and sucked thru the bearing grooves into the impeller. The pump has no stuffing box. The impeller seal ring is adjustable and the casing has a renewable wearing plate.

The pump is also used, in modified form, in the "Hydrotator" froth flotation system. These pumps are built in four sizes with 5, 10, 15 and 25 HP motors with bronze or chrome iron casing and impeller.

Automatic Pumping

Auto-Pump



70 - 650 G. P. M. 30 - 180 FT. HEAD

A fully automatic and highly efficient pumping installation in one unit, built for mine service. Starts and stops by means of electrodes, float control or time-clock. Priming by means of a priming tank, which becomes inoperative when pump is primed and therefore does not interfere with the efficient operation of the pump. Motor stops and alarm is sounded if pump cannot be primed or if it loses the water.

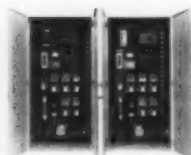
Suction-Line Primer



50 - 1500 G. P. M. 300-400 FT. MAXIMUM HEAD

Embodying the principle of the Auto-Pump, the Suction Line Primer provides a convenient and inexpensive means of converting existing installations to automatic control. In conjunction with a "Hazleton" Control Panel the system affords automatic priming, starting, stopping and complete protection for single-stage or multi-stage pumps. The primer does not affect the operation, since the friction loss is negligible.

Control Panels



AUTOMATIC PUMP CONTROL

"HAZLETON" Control Systems provide fool-proof automatic operation for centrifugal pumps of any make and size.

The expertly built panels contain all necessary control relays, mounted on an asbestos board. The panel is enclosed in a steel cabinet. A plainly marked row of terminals is provided on the board to which all connections to the external devices can readily be made by any electrician. Radio or carrier-current as well as wired telemetering type controls are available.

Signal and Alarm Panels



LOCAL AND REMOTE SIGNALING

"HAZLETON" Signal and Alarm panels provide the operator with a complete picture of the sump level conditions, whether pumps are operating, or have failed for some reason. A horn provides an audible signal. An alarm silencer button quiets the horn but maintains a red signal light until fault is cleared. Available for single or multiple pump installations. Unit shown is for three pumps.

Priming Pumps



10 - 15 - 25 - 50 - 100 CU. FT. PER MINUTE FREE AIR

These dry vacuum pumps are of the piston type and built for priming service only. The cylinders are air-cooled and are not damaged by slugs of water which may be drawn into the pump during priming. All internal moving parts are splash lubricated. The 10 Cu. Ft. pump has one cylinder, all other sizes have two opposed cylinders. The 100 Cu. Ft. machine is a combination of two 50 Cu. Ft. pumps.

Check-Valves (Mine Type)

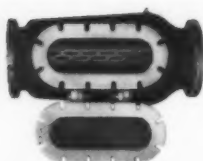


SIZES 4" TO 24" STD. AND EX. HVY. CONSTRUCTION

The internal parts of this valve, which is designed for mine service, can be lifted out of the housing as a unit. The leather-faced flap swings freely around a heavy bronze shaft. Liberal water passages result in low friction loss. All sizes can be furnished with a switch, operated by the flap, for pump protection and with by-pass piping and valve. The valves can be furnished in cast iron, bronze or stainless steel.

SIZES 4" TO 18"

Strainers



In this simple, low-loss strainer the incoming water flows from the outside thru the perforations to the inside of the strainer basket. Solids and debris settle at the bottom of the housing or become wedged in the strainer basket and can readily be removed. Baskets are of cast metal with rectangular holes or of rolled plate with round perforations. Body and basket can be had in cast iron, bronze or stainless steel.

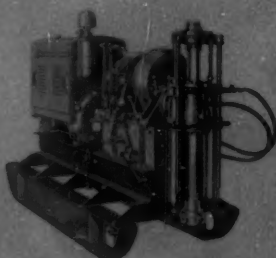
PROMPT SERVICE...

MODERN DEPENDABLE

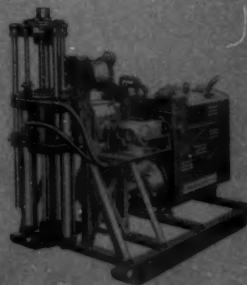
HI-SPEED DRILLING MACHINES



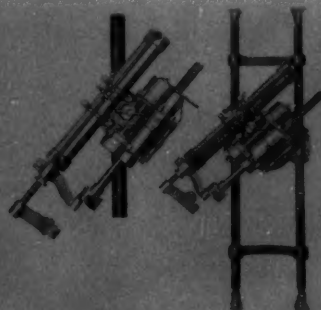
Sprague & Henwood Model 40-CL Gasoline Engine Driven Core Drilling Machine, Low mount type, with double hydraulic swivelhead, all operated with built-in circulating system. Bulletin # 185-2.



Sprague & Henwood Model 142 Diesel Engine Driven Core Drilling Machine, with built-in oil circulating system and hydraulic swivelhead. Bulletin # 160.



Sprague & Henwood Model 30 Water-Cooled Gasoline Engine Driven Core Drilling Machine with a double hydraulic swivelhead. Built-in water pump (optional). Bulletin # 350.



Model 325 and Model 530 Air operated machines for diamond core drilling underground. Driven by radial piston-type air motors, both of these modern machines have ample capacity for fast steady operation.

NOTE: All models of core drills except underground machines can be furnished with gasoline, diesel, electric, or air power units.

ACCESSORY EQUIPMENT

Sprague & Henwood's complete line of core drilling accessory equipment is manufactured from the highest quality material to insure long life and dependable service.

Many items are stocked for prompt shipment to you.

All items of accessory equipment are illustrated and described in the complete and up-to-date Bulletin # 400. This bulletin was prepared with the customer as the first and foremost consideration. If you don't have a copy of Bulletin # 400—write for your free copy today.

CONTRACT DIAMOND DRILLING

For over 75 years Sprague & Henwood has been the leader in the contract diamond drilling field. In that time, crews have completed thousands of contracts successfully, all over the world, in every conceivable condition.

For the best in exploratory core drilling (surface or underground), blast hole drilling, directional drilling, foundation test drilling, grout hole drilling, and pressure grouting—be sure to call Sprague & Henwood. Estimates and suggestions given without charge.

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LOWER COST-PER-FOOT

Sprague & Henwood, in close co-operation with the United States Bureau of Mines, initiated the practice of "Orienting" drilling diamonds in their diamond bits. It was believed that by "Orienting" drilling bits in their hard vector direction, that the "cost-per-foot drilled" should be substantially reduced.

Sprague & Henwood's contract drilling department has used over 30,000 "Oriented" diamond bits, and has supplied customers with thousands more. Proof that Sprague & Henwood "Oriented" diamond bits reduces the "cost-per-foot drilled" is explained and outlined in detail in Bulletin #320-1.

All Sprague & Henwood diamond bits are designed to do a specific job, and with information concerning your particular problem, Engineers will suggest and supply you with the Bit, Reaming shells and all accessory equipment necessary to give you the most for your drilling dollar.

Sprague & Henwood has developed four different types of matrices to be used if formation ranging from very soft, to extremely hard or highly abrasive stratas.

When you need diamond bits ... Call Sprague & Henwood in Scranton, the phone number to remember is Diamond 4-8507. You furnish the information on your conditions. They will supply you with the finest diamond drilling bits you can possibly buy anywhere.



IMPREGNATED CORING BIT
Especially suitable for drilling through hard, broken or extremely abrasive ground, where diamond loss from surface-set bits might be excessive. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs when required.



**DOUBLE-TUBE
REAMING SHELL**
Available in all standard sizes for use with all types of double-tube core barrels. Special sizes and types as required. Inserts are tough tungsten-alloy matrix set with carefully selected diamonds.



**"M" SERIES "ORIENTED"
DIAMOND CORING BIT**
For use with "M" SERIES Core Barrel, when good cores must be secured from soft or friable strata. Available in all four types of matrix and three different grades of diamonds. Also in a complete range of impregnated sizes. EX, AX, BX and NX sizes carried in stock.



**"ORIENTED" DIAMOND
"TAPER" TYPE NON-CORING
BIT**
The fastest cutting bit for drilling blast holes in very hard formations. All standard sizes.



**"ORIENTED" DIAMOND
"CONCAVE" TYPE
NON-CORING BIT**
Especially suitable for drilling round smooth holes in relatively soft formations, when cores are not required. All standard sizes available in four different types of matrix.

**"ORIENTED" DIAMOND
"PILOT" TYPE NON-CORING
BIT**
Recommended for drilling blast holes in hard formations and also for use when long straight holes must be drilled in variable formations.



**"ORIENTED" DIAMOND
CASING-SHOE BIT**
Available in the same wide range of sizes and types as the standard casing bits and designed so that they can be left on the end of the casing in the hole while drilling is continued through them with the corresponding standard size of core barrel and bit.



**"ORIENTED" DIAMOND
STANDARD CASING BIT**
Available in all standard sizes with a choice of four different matrices and three different grades of selected diamonds. Larger sizes and special designs furnished as required. Must be removed before continuing to drill with core barrel and bit.



**"ORIENTED" DIAMOND
CORING BIT**
Available in four different matrices and three different grades of correctly-sized diamonds. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs furnished to meet any specifications or requirements.

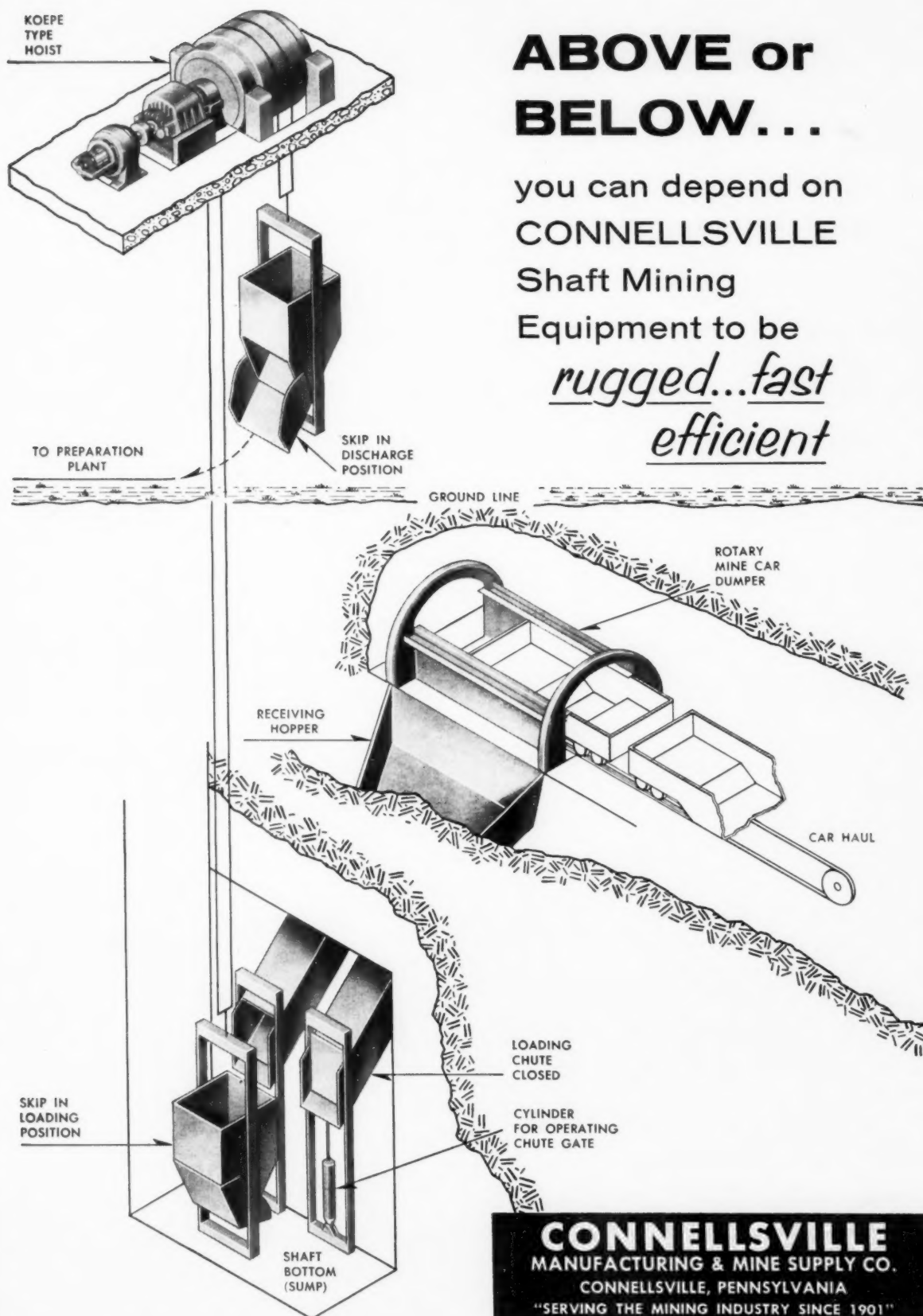
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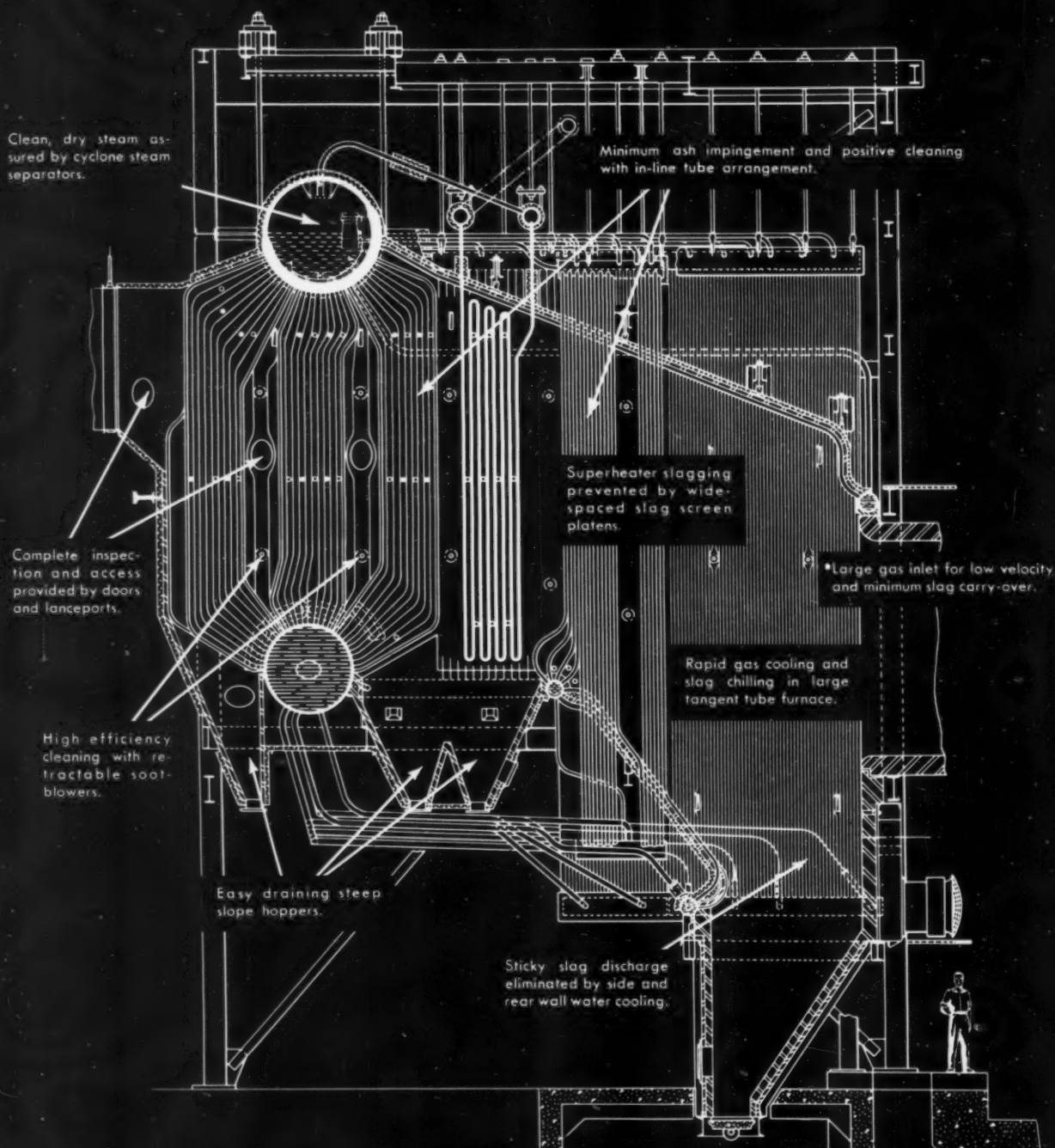
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These important design features assure trouble-free, continuous operation of this B&W Waste Heat Boiler

Empresa Nacional de Fundiciones, Paipote, Chile, uses this B&W Waste Heat Recovery Boiler to produce 42,500 lb steam per hour at 400 psig and 700 F at the superheater outlet.

HOW TO SOLVE WASTE HEAT BOILER PROBLEMS

B&W heat recovery system ends production bottleneck

A major problem in waste heat boiler operation is the fouling of steam generating surfaces by slag and ash from the process. Frequent outages and excessive labor for boiler cleaning add substantially to the cost of any plant operation. Production delays can result in further serious losses.

For example, the Empresa Nacional de Fundiciones copper smelter at Paipote, Chile was experiencing difficulty in handling high temperature corrosive gases with considerable slag and metallics carry-over. Slagging of boiler surfaces was severely limiting plant production. Unscheduled smelter shutdowns resulted in excessive refractory maintenance, high operating costs, and production losses.

B&W's engineers were asked to design a boiler to provide trouble-free operation for these difficult ash and slag conditions. An important requirement was that the new system be installed without interrupt-

ing plant operation. Utilizing the extensive experience gained from similar installations, B&W recommended a special, single pass, low draft loss boiler for the specific plant conditions at Paipote. B&W's recommendations for a completely engineered system were accepted and a waste heat boiler, flues, dust handling equipment, and auxiliaries were furnished.

The successful elimination of the waste heat handling problems, previously limiting production and causing high maintenance costs, has now been proved by several months of operation. In fact, plant production is now above design capacity.

B&W's extensive research and engineering facilities, plus its broad field experience in design and operating requirements in the metallurgical process industry, are available to solve your problems. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.



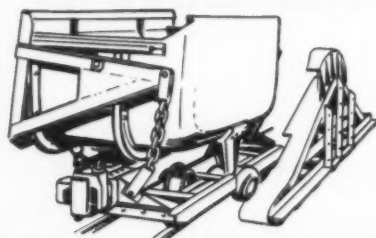


FOR YOUR PRODUCTION

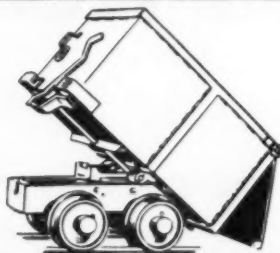
Our shops are known to mining men throughout the world for custom building of mine cars and other haulage equipment. Here are some of the standard and custom designed items made by Card. For complete information, write or phone. Frequently modification of a standard Card

car will serve to meet every specification of special haulage at very little more than the cost of a standard car. Our engineers can show you how to standardize your mine haulage with cars that are custom built for you alone. Many mine operators find they cannot afford even to make car

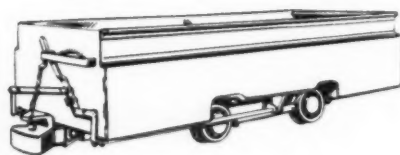
Granby Car with Dump Block



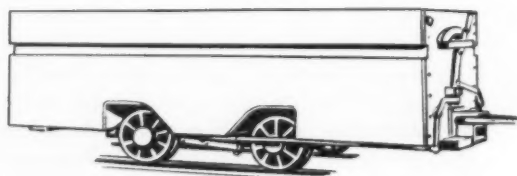
End Dump Turntable Type Z



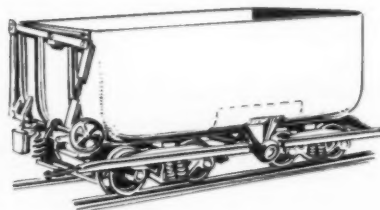
All-steel Rotary Dump Car



All-steel Rotary Dump Car



Large Capacity Granby Car with Mechanical Brakes

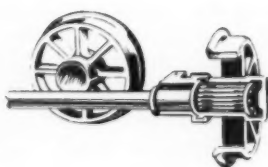


Coal Mine Cars
Ore and Industrial Cars
Mine Car Wheels & Trucks
Sheaves—Rope, Knuckle, Curve
Track Rope Rollers, Slope
Rollers
Carrying Sheaves, Swivels,
Hitchings
Loading Booms, Landing Chairs
Automatic and Plain Cages
Skips and Dumps
Revolving Screens
Perforated Screen Plates
Truckloaders
Track Turnouts
Frogs, Crossovers, Guard Rails
Split Switches
Switch Stands
Track Turntables
Rail Sections and Parts

Bicycle Spoke Sheaves



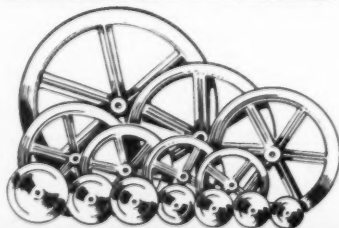
Card Roller Bearing Truck



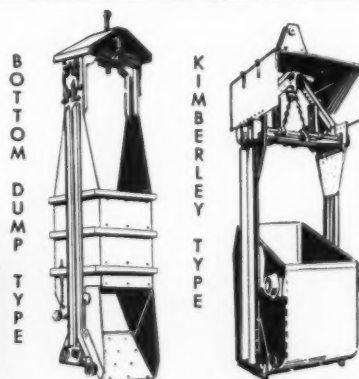
Card Timken Bearing Truck



Standard Rope Sheaves, Heavy Pattern



Card Automatic Skips



Be your production large or small, Card can fit your needs—economically. Our engineers are available for consultation on your haulage problem. No obligation.

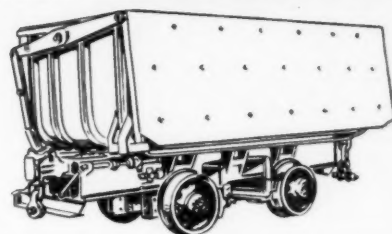
HAULAGE **Pick a winning Card!**

bodies and repair parts...Card prices are lower even after freight costs are added.

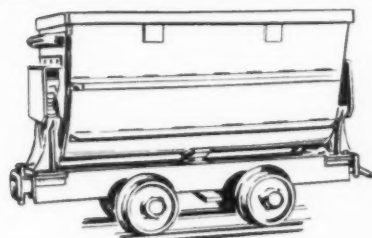
Note the partial list of customers below. Some are now replacing original orders after 10-20 years...with Cards, of course.



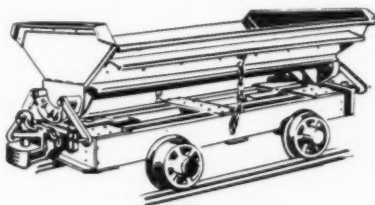
A Popular Granby-Type Car



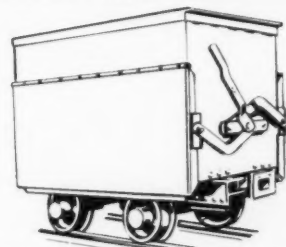
Rocker Dump Car



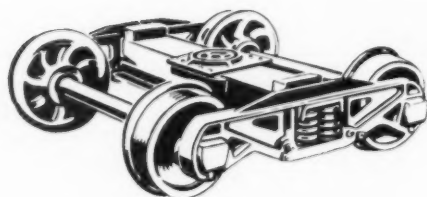
Rocker Dump Car, extra low



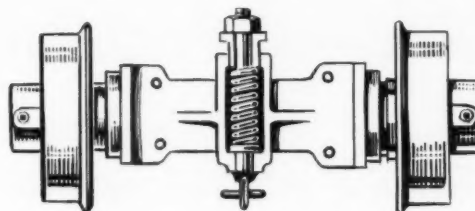
Gable Bottom Type Car



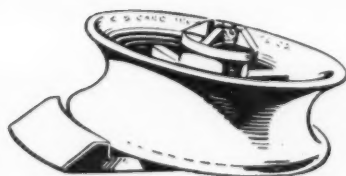
Spring Mounted Bolster Truck



Patented Spring Drawbar Truck



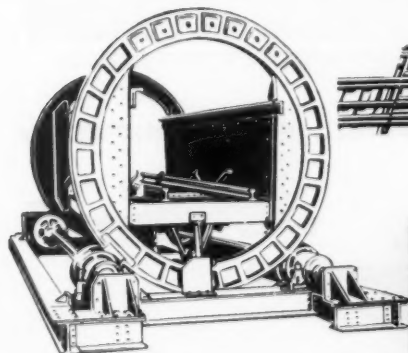
Card Curve Sheave



Roller Bearing Track Rope Roller



Card Power Driven Rotary Dump



Example of Card Track Equipment



CLIMAX MOLYBDENUM
INTERNATIONAL MINERALS
PHELPS DODGE
KENNECOTT COPPER
U. S. VANADIUM
U. S. POTASH
VERMONT COPPER
HOWE SOUND
CALERA MINING
HOMESTAKE
TELLURIDE MINES
IDARADO
CANANEA CONSOLIDATED
COPPER CO.
ANACONDA
VICTOR CHEMICAL WORKS
CLEVELAND CLIFFS IRON
POTASH CO. OF AMERICA
CONSOLIDATED MINING &
SMELTING CO. OF CANADA
AMERICAN SMELT. & REF.
UNITED STATES SMELT. REF.
& MINING
UNION PACIFIC COAL
GENEVA COAL CO.
COLO. FUEL & IRON CORP.
INDEPENDENT COAL & COKE
COLO. & UTAH COAL
TUNGSTEN MINING
NEW JERSEY ZINC

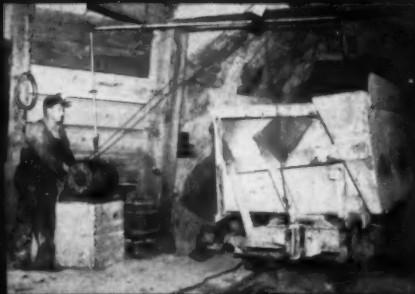
C.S. Card Iron Works Co.
2501 West 16th Ave.
Denver, Colorado



SLUSHERS
2 or 3 drum, air or electric models



CORE DRILLS
for blast holes or cores



SINGLE DRUM AIR HOISTS



DRILLMOBILES



AXIVANE FANS AND BLOWERS



HYDRO DRILL JIBS AND JUMBOS

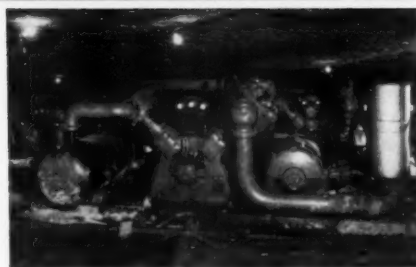
*Speed Development...
Increase Production*

WITH MODERN

JOY MINING EQUIPMENT

JOY MANUFACTURING COMPANY

Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company
(Canada) Limited, Galt, Ontario.



AIR COMPRESSORS
Stationary and portable models



SHOVEL LOADERS IN ELECTRIC OR AIR MODELS



**TUNGSTEN CARBIDE
INSERT ROCK BITS**



STOPPERS

JOY

...EQUIPMENT FOR MINING...FOR ALL INDUSTRY



AIR LEGS



**HIGH PRESSURE
HYDRAULIC DRILLS**



DRIFTERS

THE DEISTER CONCENTRATOR COMPANY

CONCENTRATOR
PRODUCTS

The Original Deister Company—Incorporated 1906
Manufacturers of Vibrating Screens, Ore Concentrating and Material Washing Tables

CONCENTRATOR
PRODUCTS

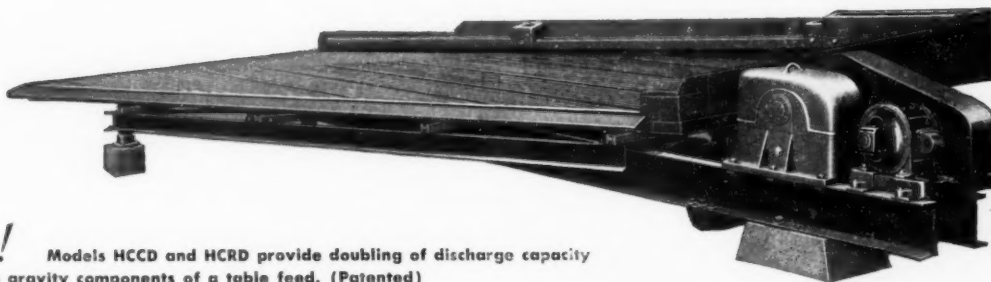
929 Glasgow Avenue, Fort Wayne, Ind.

Export Sales 60 Beaver St., New York 4, N. Y.
Pennsylvania Sales 35 E. Center St., Nesquehoning, Pa.
Alabama Sales 2612 North 24th St., Birmingham, Ala.

The Galigher Co., 545 West Eighth South St., Salt Lake City 10, Utah
Drilling & Mining Equipment Co., 2020 Sacramento St., Los Angeles, Cal.
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50 YEARS EXCLUSIVELY ENGAGED IN THE MANUFACTURE OF SEPARATING AND SIZING EQUIPMENT

SuperDuty® DIAGONAL-DECK CONCENTRATING TABLES



New!

Models HCCD and HCRD provide doubling of discharge capacity for high gravity components of a table feed. (Patented)

DIAGONAL-DECK Tables

Our DIAGONAL-DECK Concentrating Tables have been accepted as the standard the world over for more than a quarter of a century. Leading this line of outstanding and time proven tables is the *SuperDuty* DIAGONAL-DECK table, firmly established by substantial commercial applications as the most advanced in features, performance and practical advantages.

THE *SuperDuty* TABLE

- ♦ OFFERS HIGHER CAPACITY—Small middling loads, a direct result of the DIAGONAL-DECK design, plus greater efficiency of CONCENTRO® Head Motion means more tons of new feed handled per day per table.
- ♦ SURPASSES IN RECOVERY any other concentrating table built while maintaining comparable or higher feed and product capacity.
- ♦ MAKES HIGHER GRADE PRODUCTS because "laning out" action of the DIAGONAL-DECK design permits more accurate cutting of product yield.
- ♦ YIELDS THE GREATEST PROFIT by its overall efficiency in performance and matchless operating economy.
- ♦ REQUIRES ONLY 2 H.P. Motor on the No. 6 Ore Table for starting and substantially 1/2 H.P. under continuous operation. The No. 7 Coal Washing Table requires only a 3 H.P. motor to start and substantially 1 H.P. under continuous operation.
- ♦ OFFERS A RECORD MAKING HEAD MOTION. The CONCENTRO Anti-Friction Head Motion is a modern, efficient mechanism far ahead of the field. First in application of anti-friction bearings, its leadership has been maintained over two decades. Outstanding performance is fully verified through field-wide acceptance.
- ♦ IS THE SMOOTHEST AND EASIEST RUNNING table ever built, by virtue of its sturdy balanced supports, deck operating design and outstanding head motion.
- ♦ IS A COMPLETE MACHINE—embracing more than just a head motion, deck and a few slide bearing units requiring the addition of adequate frame and support elements to build into a finished and properly aligned machine that can be completed only at user's full responsibility and extra expense.
- ♦ CANNOT BE EQUALED FOR LOW COSTS in operation and maintenance.
- ♦ IS DEFINITELY OUT IN FRONT as your best, safest and most profitable choice considering both your investment and operating dollars.



SuperDuty DIAGONAL-DECK Ore Tables

Minerals—Metallic—For the recovery of mineral values from gangue, for the differential separation of complex minerals, DIAGONAL-DECK Deister-Overstrom Tables long proved their value. A logical development from these sturdy forerunners, the *SuperDuty* DIAGONAL-DECK Concentrating Table is today proving itself the most highly developed and successful wet gravity concentrating apparatus in the world's leading mills. Used ahead of flotation, these tables effectively eliminate barren coarse gangue and reduce the tonnage for fine grinding; relieve the pulp of a large part of the mineral load and lessen the burden on the more intricate flotation process. Following flotation, tables are used to recover the tarnished, oxidized or carbonate mineral particles that are so ineffectively recovered by flotation.

SuperDuty DIAGONAL-DECK Tables used as pilots in flotation guide the operator in regulating the flotation oils and reagents. Pilots are used on concentrates, middlings, intermediate products, tailings and are placed in various parts of the flow-sheet.

On carbonate or oxidized ores especially, these tables have proven the simplest and most economical method of concentration.

Minerals—Non-Metallic—The use of tables on non-metallic minerals is now general. For the separation of silica, feldspar, iron and granular particles from kaolin and in the recovery of mica, garnet, silica, cyanite, barytes, fluorspar, graphite, phosphate, potash, etc., tables have proven their commercial value. *SuperDuty* DIAGONAL-DECK Tables are used successfully on the most difficult separations; for example: the differential concentration of barite-iron-silica or garnet-silica-mica.

Recovery of Values from Residues—The residual sands and ashes resulting from operation of brass and other metal foundries have a high metallic content. Formerly this sand was washed by hand and an inefficient recovery made. *SuperDuty* tables are now used on foundry residue and efficient recovery is made of even the very finest metallics. Copper, brass, tungsten, zinc and many other metals are recovered from waste materials at a substantial profit.

WRITE FOR CATALOGS

Patents on equipment owned or controlled by The Deister Concentrator Co. Trade-marks registered in U.S. and foreign countries.

CATALOGUE, SURVEY & DIRECTORY NUMBER, 1958

SuperDuty DIAGONAL-DECK Coal Washing Tables

The SuperDuty DIAGONAL-DECK Table cleans either bituminous or anthracite coal. Although most widely used on the sizes finer than $\frac{3}{4}$ ", installations on sizes up to $1\frac{1}{4}$ " are eminently successful. Conversely, because of ultra mobility and smoothness of deck operation, effective work is now possible on extremely fine sizes—within the minus 48 mesh range. Clean coal is being recovered in many instances from the refuse products of other coal cleaning devices, both with and without recrushing. Another source of table feed is the undersize from dewatering screens which follow other coal cleaning machines. Reject materials forming culm banks, river deposits and waste piles may in many instances be reclaimed. In fact, the SuperDuty table may be used on any cleaning problem where there is a specific gravity difference between relatively free particles of coal and refuse.

Design—SuperDuty DIAGONAL-DECK Coal Washing Tables are designed for efficient cleaning of coal, especially those sizes which jigs and similar machines fail to handle efficiently and profitably.

Installation—DIAGONAL-DECK Coal Washing Tables may be installed singly or in battery. Number of tables required is governed by tonnage to be handled. Tables in battery installation operate as independent units, consequently, individual tables may be cut in or out to meet variations in production schedule profitably.

Investment—SuperDuty DIAGONAL-DECK Coal Washing Tables represent the lowest initial investment regardless of size of installation. These tables meet the requirements for efficient cleaning, low operating costs and production flexibility.

Operation—This process, employing wet gravity principles, offers the greatest simplicity in operation, while full visibility of separation accounts for the finest results by unskilled attendants.

No other process can equal their performance on sizes $1\frac{1}{4}$ " to finest dust. High efficiency is attested by their elimination of 90% or better of the free impurities including slate, sulphur, pyrite, shale, fire clay, gravel, bone and tramp iron. Simultaneously loss of coal to refuse is minimized beyond the possibilities of other processes.

Capacities—Depending on type and size of coal, washability and cleaning requirements, capacities of DIAGONAL-DECK Tables run from 4 to 20 tons per hour.

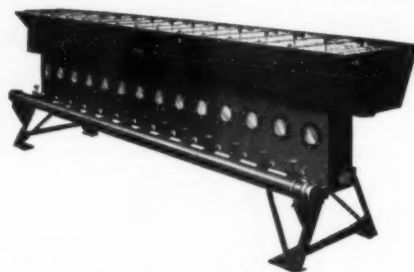
New Specialized Models—The new Models HCRD and HCCD are specialized designs of the No. 7 and No. 6 sizes, respectively, of the SuperDuty DIAGONAL-DECK Concentrating Table. In these models, that portion of the deck periphery available for discharging high gravity feed components is doubled, without subtracting from the low-gravity discharge periphery, thereby doubling available high-gravity discharge capacity, with attendant increase in table feed capacity. These models are intended for the high capacity handling of feeds wherein the high-gravity fraction represents a relatively large percentage of the total. Phosphate rock, coal and the ores of iron and chrome provide typical fields for application. For other feeds, wherein the high-gravity fraction represents a relatively small percentage of the total, the well known, regular models of SuperDuty DIAGONAL-DECK Concentrating Tables are applicable, as in the past.

CONCENCO® DISTRIBUTORS

The CONCENCO Revolving Feed Distributor, built in six types, is a heavily fabricated, all steel machine with motor drive requiring only $\frac{3}{4}$ H.P. in operation. The Distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions from two to sixteen, in some cases more. It is especially suitable for efficiently feeding any number of circuits or machines in battery for higher overall efficiency. It is unexcelled for feeding concentrating tables.



CONCENCO® CPC Classifiers



CONCENCO Constriction Plate Classifiers of all steel welded construction are furnished in any number of cells from 2 to 14 to meet requirements. Each cell is square in horizontal cross section and consists of three chambers: the pressure chamber at the bottom; the sorting column immediately above and separated from the pressure chamber by a constriction plate; and the launder section above the sorting column, which is materially increased in cross section to reduce velocity of flow.

CONCENCO® Super Sorter

Giant High Tonnage
Multiple Spigot Classifier

Patented



The CONCENCO SuperSorter does what engineering opinion had formerly held to be impossible... it sorts granular materials hydraulically into a number of uniform, graded products on a low cost, high tonnage basis. The barriers of the past have been overcome in the CONCENCO giant classifier, which maintains teeter and zone densities hitherto considered impossible in large cell cross-sections needed for handling substantial capacities.

Applications

The CONCENCO SuperSorter meets that long-felt need for a multiple spigot, rising current classifier of sufficiently high capacity to handle economically coal, sand, iron ore, phosphate rock and similar granular minerals.

Capacities and Performance

The first battery of four 8-cell units installed has been in successful commercial operation for over eight years, classifying $\frac{1}{4}$ " x 0" feed to a large battery of coal washing tables. Each SuperSorter unit handles in excess of 100 tons per hour, demonstrating phenomenal performance for both tonnage and efficiency. In the production of concrete sand, to the strictest engineering specifications, the SuperSorter has proved eminently successful. On minus 8 mesh sand, an 8-cell unit produces 130 tons per hour of accurately classified products.

Dimensions

The size and proportions of the CONCENCO SuperSorter may be quickly visualized from the following general data covering the 8-cell machine. The overall height, including 6" H-section supporting legs, is 14 feet. It is 6 feet wide and 40 feet long. Approximate weight, empty, is 16 tons.

Operation

A feature of the CONCENCO SuperSorter is the innovation for control of spigot discharge. Each classified spigot product is intermittently drawn off, with measured precision, from a quiescent bed at the bottom of the cell. High capacity discharge of product is maintained with minimum water content and without disturbing the rising water currents or unbalancing classification in the sorting column immediately above. The novel constrictor valve mechanisms that control the draw-off from each cell are readily adjustable in operation over a wide operating range from open 90%, to closed during 100% of each cycle. The Constrictor valves permit a positively measured and uniform discharge rate from each cell—a condition essential to the high efficiency of the SuperSorter and to overall efficiency when operating in conjunction with concentrating tables or similar devices.

Water and Power Requirements

Water requirement is low for apparatus of this type. Hydraulic water is brought to the individual cells by means of a 12" header pipe and regulated with easily adjustable pinch valves. The only power required is for actuation of the tandem operated constrictor valve mechanism. A 1½ horsepower motor with gear reducer amply provides for even the largest multiple cell units. There being no other moving parts, operating costs are amazingly low.

Range

CONCENCO SuperSorters are now available in a range of sizes to meet the needs of any high tonnage classification problem. The individual cells are incorporated with a rectangular, partitioned tank provided with feed entry, adjustable overflow weirs and overflow exit. All construction is of heavy type.

THE Leahy® SCREEN . . . New Model E Now Available with FlexElex Heating of the Jacket

Due to their rugged construction and mechanical simplicity, Leahy Vibrating screens far outdistance other devices in overall equipment life.

The heavy duty vibrator, doubly dust-proofed type and enclosed, and forming an integral part of the structural steel bridge assembly, delivers a stronger and more positive vibration than ever before, superenergizing every square inch of screen jacket with the characteristic stratifying-screening-unblinding vibration, that is so highly acclaimed and profitably enjoyed by Leahy screen users. Leahy differential vibration guarantees open meshes, which in turn insure higher screening efficiency and capacity.

Uses—For wet or dry screening from 3" opening down to fine mesh; also for dewatering and heavy media recovery. Unexcelled for screening at fine meshes.

Features—The new Model E Leahy Screen has simplicity combined with proved ruggedness. Installation is inexpensive, with supports figured for dead load only, because no vibration goes into the screen frame or supports, and only ½ H.P. is used to operate. The heavy duty vibrator, running-in-oil at 265 r.p.m., produces 1200 to 2000 v.p.m. as needed. Maintenance is negligible—averaging less than 1% of first cost annually. Screen jacket economy is reflected in costs as low as \$0.000574 per ton treated. The quickest jacket change feature offered in screening equipment combines with the use of reasonably priced stock jackets of woven wire and, with some models, perforated plates.

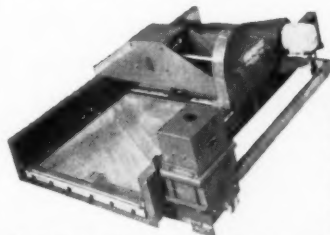
Types and Sizes—Open type, totally enclosed dustproof type; single or double surface; belt drive or motor drive



The Guaranteed Screen

in sizes: 17x32 in.; 2x4 ft.; 3x5 ft.; 3x6 ft.; 3x7 ft.; 4x5 ft.; 4x6 ft.; 4x7 ft.; 4x8 ft.; 5x6 ft.; 5x7 ft.; 5x8 ft. Size designation indicates the overall dimensions of the screen jacket. *Special sizes built to order.*

FlexElex® Electric Heating of Wire Screen Cloth



The FlexElex heating arrangement is engineered especially for fine mesh screening of damp materials such as ores, fine coal, clays, shales, pulverized limestone, chemicals, etc.

A low voltage, high amperage electric current is passed through the screen cloth, causing it to heat sufficiently

that the wires are kept warm and dry, to prevent any build-up of dust-size fines that contribute to blinding.

When the advantages of FlexElex heating are added to the Leahy unblinding action for disposing of intermediate size particles, the result is an efficiency and capacity never before achieved in the screening field. Screening at an accustomed mesh, capacity is stepped up to an astounding degree. On the other hand the same capacity may be maintained with smaller mesh openings formerly considered impractical.

DESCRIPTION. The FlexElex electric jacket heating system for the average size Leahy Screen comprises: a 15 KVA dry type single phase transformer with line voltage primary and low voltage secondary, complete with controls for closer adjustment of current and heat used. Short, high capacity aluminum bus bars connecting transformer to aluminum mounting bars at jacket eliminate flexible cables or connections in the heating circuit. Highest electrical and thermal efficiency is assured by the most practical design of circuit and heavy bus bars of generous cross section in laminated assembly with airgap spacing.

POWER REQUIRED for the average size screen amounts to only 9 or 10 KVA under normal temperature and moisture ranges. With the FlexElex system it is easy to regulate the current to meet day to day or season to season operating conditions with optimum results at minimum power consumption.

SCREEN JACKET CHANGE TIME. Screen jacket changes can be made with the same ease as with conventional type Leahy Screens. Furthermore, jackets need not be changed as often. Field experience shows that even with less expensive grades of cloth, the life of electrically heated jackets, requiring no heating or brushing, is several times that of unheated cloth.

OVERALL ECONOMICS. Users say that the elimination of attendants for cleaning screen cloth, as well as materially reduced power consumption for grinding (resulting from the accompanying reduction of circulating load, credited to increased screening efficiency of FlexElex equipped screens), generally more than offsets the cost of the equipment and power used to heat the screen cloth.

CONCENCO Spray Nozzle—Water Sprays

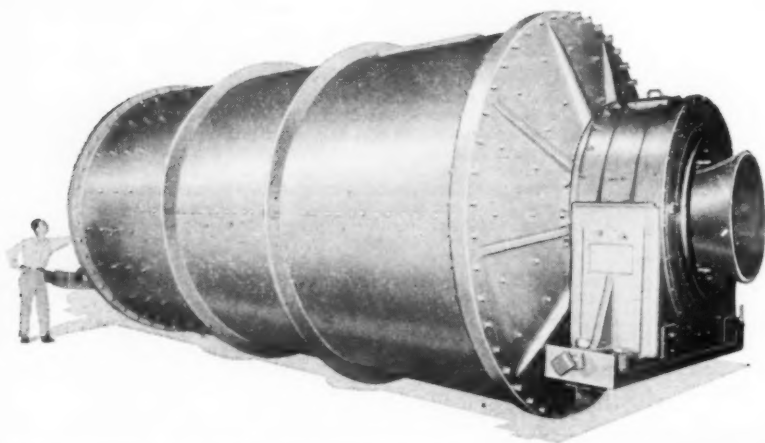
CONCENCO Spray Nozzles are unique and efficient. They are easy to apply. A hole is drilled in the pipe and the nozzle bolts on by means of a brass "U" bolt. No threading is necessary. The jet is a flat line spray very effective in washing or screening. The jets can be perfectly aligned one with another for sheet flow washing. The J-132 series with orifices of ¼" to ¾" fit 1" to 2" pipe. The J-136 series with orifices of ⅜" to ¾" fit 2" to 4" pipe.



KENNEDY...

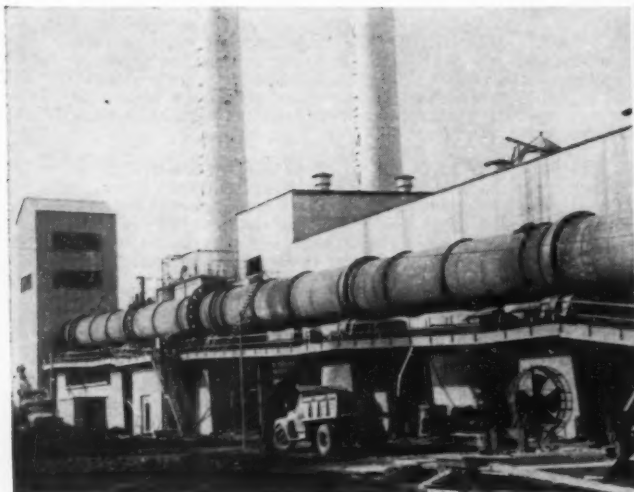
We manufacture everything from a crusher to a conveyor system. Complete KVS Mining Plants are in use throughout the world, engineered to

meet specific requirements for handling all types of rock and ore. Consultations with KVS engineers can be arranged anywhere . . . any time!

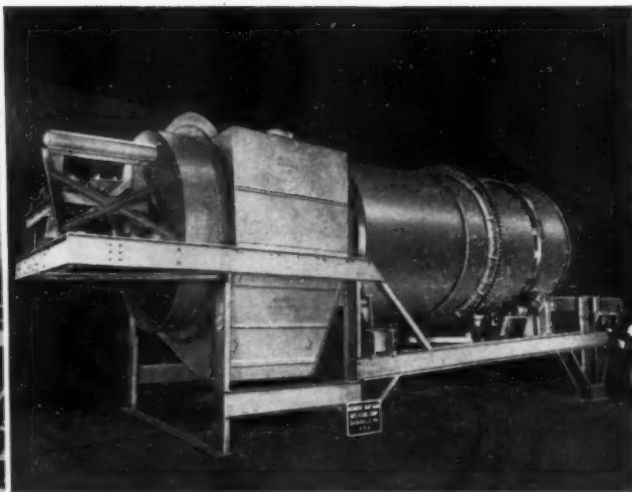


BALL, ROD, TUBE MILLS

For grinding and pulverizing; wet or dry process—any dimensions or capacities.



ROTARY KILNS: Heavy Duty...Cement...Wet or Dry Process, Lime, Calcined Coke, Dead Burned Dolomite, Nodulizing and Agglomerating.



BALLING DRUM For pelletizing iron ore.

Send for Bulletin describing KVS Machinery and Equipment.

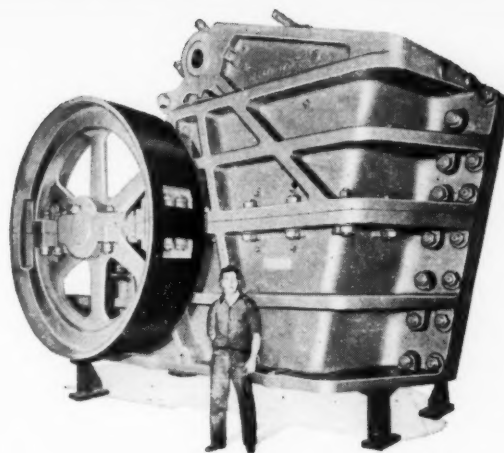
KENNEDY-VAN SAUN

Machinery and Equipment for the Mining Industry...



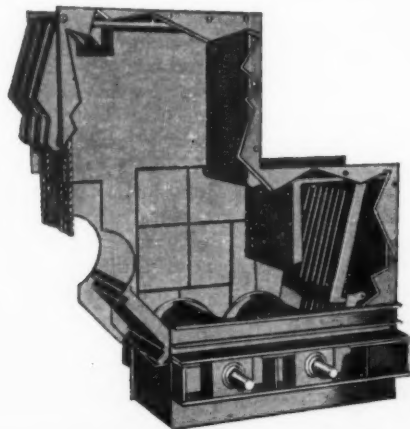
GEARLESS GYRATORY CRUSHERS

Primary and Secondary—Noted for efficiency in crushing. Wide range of sizes and capacities—V-Belt Drive or synchronous motor, built integral into pulley.



SWING JAW CRUSHER

Heavy Duty . . . Wide Range of Sizes. Jaw plates reversible. Frames of larger sizes built in four sections. Shaft cast integral with Swing Jaw. Automatic Lubrication System.



CUBER SENIOR IMPACT BREAKER

Multi-stage, regulated flow impact breaker for primary and secondary crushing. Dual rotor, triple action. Available in stationary or portable models.

KENNEDY PRODUCTS

- Gyratory Crushers
- Swing Jaw Crushers
- Tube Mills
- Ball & Rod Mills
- Vibrating Screens
- Rock Feeders
- Air Swept Tube Mills
- Rotary Kilns
- Coolers, Dryers
- Preheaters, Deheaters
- Belts, Conveyors
- Pneumatic Transport Systems
- Waste Heat Boilers
- Pulverized Coal Firing Systems
- Steam Generators
- Asbestos Plants
- Complete Lime Plants
- Complete Cement Plants
- Complete Aggregate Processing Plants

MANUFACTURING & ENGINEERING CORPORATION
405 PARK AVENUE, NEW YORK 22, N.Y. • FACTORY: DANVILLE, PA.

AMSCO®

...digging



AMSCO DIPPERS

Designed for speed, heavy duty . . . Cast of 12-14% Manganese Steel to wear longer

Renewable lip—2-piece welded designs—backhoes—Mesabi dredge types—special-purpose designs on order—complete line of accessories.

Streamlined jutting lip and fanned teeth bite up full loads at normal power. Angled bottom means less crowd, reduces heeling, makes digging fast and easy.

You get extra wear because they're cast of tough Amsco manganese steel—work-hardening, abrasion resistant. It won't break. Resists cracking. Weighs no more than comparable fabricated dippers, same capacity.

Special features include: (1) rubber-cushioned door (optional); (2) plug-welded side seams; (3) integrally cast lugs on dipper backs; (4) cast-in pin connecting lugs; (5) interchangeability of repair parts.

Write for *Amsco Power Shovel Equipment* booklet to be available soon, containing complete details for all types.



Amsco backhoes feature the faster, easier-digging, streamlined design common to all Amsco dippers . . . plus the high strength and wear resistance of manganese steel.



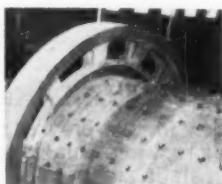
Amsco lightweight, two-piece, welded dippers take heavy-duty digging shift after shift . . . withstanding abuse, conserving power, making every load a full load.



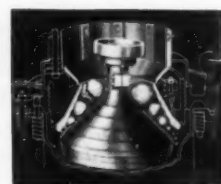
AMSCO crusher and breaker parts

Won't break! Work-harden under impact! Cast of "toughest steel known"!

Amsco makes manganese steel crusher and breaker parts for most major manufacturers of crushing, grinding and pulverizing equipment. Improved resistance to wear because the surface of manganese steel work-hardens under repeated impact up to 500 Brinell. Yet, beneath the working surface, the metal remains strong and ductile, able to give slightly under crushing forces . . . absorbing abuse, resisting cracking or chipping, even when worn thin. *Buy your replacement parts from your crusher manufacturer to be sure of getting Amsco manganese steel.*



Amsco manganese steel ball mill liners work-harden to a degree that further abrasion only polishes the hard surface of the metal, reducing wear rate tremendously.



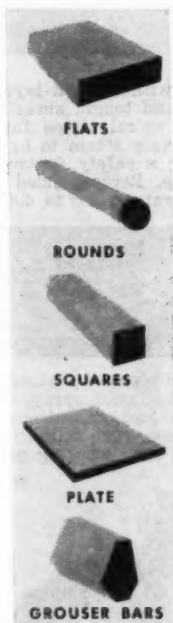
Amsco crusher concaves and mantles add extra service life to cone crushers of all types.

crushing, wear-fighter line

EASY TO WELD

AMSCO SHAPES—REPOINTERS cast of 12-14% manganese steel

Reinforce points of extreme wear with work-hardening Amsco 14% manganese steel shapes. Truck beds, chutes, crushers, blades, dipper interiors... wherever impact and abrasion cause early wear-out. Amsco shapes are easy to weld, manganese to manganese, or manganese to carbon steel. Size range is complete to fit all equipment.



FLATS

ROUNDS

SQUARES

PLATE

GROUSER BARS

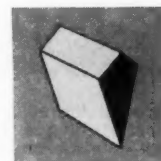
Wear-Sharp repointers*

Work up to 6 times longer than standard repointers. Corners won't blunt. Entire leading edge wears evenly.



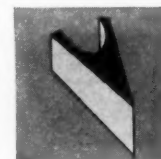
Repointer bars

Three-foot bar lengths. Also ideal for rebuilding worn lips of all digging equipment.

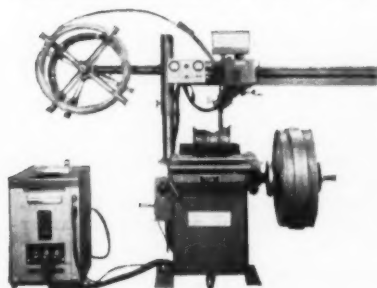


Cast-to-shape repointers

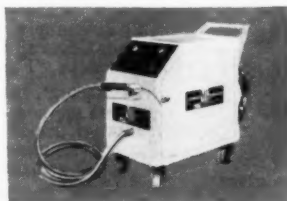
For fast, easy repointing of teeth used in less severe digging. Applied in 15 minutes, using only two electrodes.



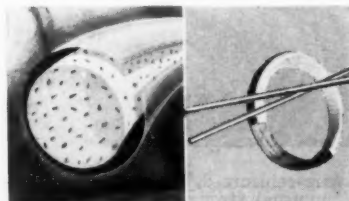
FULL WEAR-FIGHTER LINE OF AMSCO HARDFACING WELDING EQUIPMENT AND MATERIALS



Automatic welders



Semi-automatic MF welders



Manual, automatic rods & electrodes

Now you can get a hardfacing material to lick every type of wear. Impact alone! Impact plus abrasion! Abrasion alone! Amsco's line is complete and includes the new high-speed, more economical *tube rod* for semi-automatic build-up and repair. You'll save hours of down time, reduce welding time and materials cost... plus extending service life of your equipment... by using Amsco machines and hardfacing materials. Write for a complete description of this wear-fighter line.

*REG. U. S. PAT. OFF.



AMSCO

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILLINOIS



GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION: 430 WHITEHEAD ROAD, TRENTON 4, N. J.

BRANCHES: PHILADELPHIA • NEW YORK • BOSTON • PITTSBURGH • INDIANAPOLIS • CHICAGO • DETROIT
KANSAS CITY • ST. PAUL • LOS ANGELES • SAN FRANCISCO • SEATTLE • SPOKANE • PORTLAND • SALT LAKE
CITY • DENVER • HOUSTON • MILWAUKEE • ATLANTA • CHARLOTTE • STUART and MIAMI, FLA.

Goodall Rubber Company of Canada, Ltd., Toronto

Distributors in Other Principal Cities.



"BROWN CORD"
AIR HOSE

Sizes ½" to 1", I.D.

A molded-and-braided hose for drilling, riveting, and other general pneumatic tool service. Tube, carcass and cover are combined to assure great strength and durability, without impairing flexibility and easy handling. Oilproof tube; rubber cover. Available in lengths up to 500 feet.



"SUBWAY"®
AIR HOSE

Sizes ½" to 1¼", I.D.

Another Goodall "Standard of Quality" hose especially built for rock drilling and all other heavy-duty air tool work. Light weight, flexible, easy to handle. Tough, oil-proof black rubber tube; highest quality wrapped duck carcass; wear- and weather-resistant red rubber cover, with yellow criss-cross stripe. Maximum lengths of 50 feet.



"HARDROK"®
WIRE BRAID
AIR HOSE
"Standard of Quality"

A super-hose for rock drills in construction, quarrying, mining and any other heavy-duty air service. Longwearing, oilproof Synplastic tube; horizontally braided steel wire carcass; tough yellow rubber cover, with black spiral stripe for identification. Light in weight, extremely flexible. Sizes ½" to 2", inclusive; two and three braid.



"NEWTYP"
SUCTION AND
DISCHARGE

Patented wire-reinforced, woven cord construction gives "Newtype" unusual strength and durability for both suction and discharge. Light weight, extremely flexible. Cannot kink, buckle or collapse, yet if accidentally crushed, can be quickly rounded into shape again without harm. Smooth bore. Sizes 1" to 4", I.D. Max. lengths of 50 feet. Black cover, green spiral stripe.



"BUCKSKIN"
WATER HOSE

Sizes ½" to 4", I.D.

Long famous for quality and reliability in every water hose service. Tube is of slow-aging rubber stock—tough and pliable. Strong rubber cover withstands roughest surface wear and abuse, and affords maximum protection to cotton duck carcass from contact with moisture. Maximum lengths of 50 feet.



"INFERNO"®
STEAM HOSE

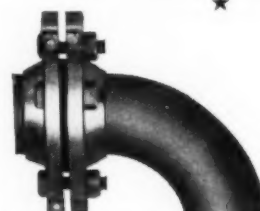
Sizes ½" to 2½", I.D.

Built with multiple-layer wire braid carcass, heat-resistant tube and tough, abrasive-resistant red rubber cover with black spiral stripe for easy identification. Wire braids will cause steam to be diffused from damaged hose, providing a safety factor against sudden burst. Extremely flexible. Recommended for pressure up to 200 lbs., and temperatures up to 400°F. Maximum lengths of 50 feet.



"ALL SERV"
General Purpose
HOSE

For all types of pneumatic tools—also water, oil, chemicals, gasoline, paint spray, etc. A very flexible all-"Synplastic" molded-and-braided hose, in one, two or three braid construction, with tough wear-resistant red cover. Sizes ¼" to 1½", for working pressures from 200 lbs. to 300 lbs.



★ ★ ★
"KEMITE" DUCT
WITH
"FLANG-LOK"
Floating Flanges

For mine suction and discharge. Tube offers highest resistance to abrasive wear. Wire-reinforced carcass will not kink or collapse. Cover is tough, long-wearing rubber compound. Generally furnished with "Flang-Lok" Ends, to accommodate "Flang-Lok" Flanges. Sizes up to 4", I.D.

"FLANG-LOK" FLANGES provide the most convenient and efficient method of connecting "Kemite" Duct, effecting a leakproof, rubber-to-rubber seal, and permitting full flow. For bolt alignment, flanges turn independently of the duct or pipe. No gaskets or washers. All sizes.

"GOODITE" FLEXIBLE PIPE. Same construction and advantages as "Kemite" Duct, above, but available in larger sizes—up to 12", I.D.

"LONG-LIFE" PLASTIC PIPE

Goodall "Long-Life" Plastic Pipe is made in three types—Flexible, Semi-Rigid and Rigid—under conditions assuring the highest degree of quality and uniformity. The Flexible type is produced from virgin Polyethylene in Standard Wall, 75 lb. Job Rated and 100 lb. Job Rated, all certified non-toxic by N.S.F.

"Long-Life" Semi-Rigid Plastic Pipe is the Cellulose Acetate Butyrate type and is available in Standard Wall, sizes ½" to 6" inclusive.

The Rigid Type is a compound of unplasticized Polyvinyl Chloride (PVC)—well known for its superior impact and tensile strength and great resistance to a wide range of industrial chemicals. Made in Wall Thickness Schedules 40, 80 and 120, in sizes ½" to 8".

The GOODALL Trademark on hose, belting, boots and clothing for the Mining Industry represents a standard of quality and reliability established through sixty-eight years of manufacturing experience, backed by continuing research and development. Product specifications are based on first-hand knowledge of mine service requirements, with selected materials, expert craftsmanship and careful inspection assuring the utmost in on-the-job performance and economy.



EST. 1870



CONVEYOR BELTING

"SUPER TRIPLE-S." Goodall's finest grade. Heavy duck carcass, high tensile rubber covers and strong friction between plies. Designed to carry run-o-mine coal, ores, slag and crushed limestone up to 10", wet or dry. Widths up to 48".

"TRIPLE-S." Same superior quality as "Super Triple-S," but of somewhat lighter construction. Widths up to 48".

"GOODALL." The right belt for the great number of lighter conveying jobs where the extra

qualities of "Super Triple-S" and "Triple-S" are not required. For sized coal, crushed stone, gravel, shells, ashes, etc. Widths up to 48".

ELEVATOR BELTING

"SUPER TRIPLE-S," "TRIPLE-S" and "LA CROSSE" are long-established Goodall brands, built to specifications that assure reliable, economical service under conditions for which each is designed. "La Crosse" made in widths up to 30", others to 48". Available with extra features—punching, stitching, end-less—if desired.

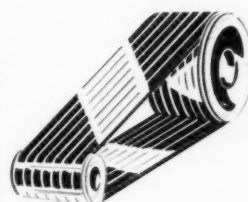


"POWER KING" TRANSMISSION BELTING

Friction surface, raw edge construction, especially built for most severe service. Minimum stretch and firm contact with pulleys at high speeds. Highest quality skim friction between plies. 35 oz. silver duck.

"POWER KING" High-Capacity V-BELTS

Built with larger, stronger, endless twin grommets to transmit greater H.P. This means fewer belts per drive, reduction in over-all weight, and less space required for any given load. The only high-capacity belts with so little stretch that the efficiency of the drive is not affected. Greater flexibility gives "Power-King" V-belts one-third more gripping power than other types... they pull heavier loads.



★ ★ ★

PUMP DIAPHRAGMS
PUMP VALVES
PISTON PACKING
ASBESTOS PACKING

RUBBER SHEET PACKING
RUBBER & DUCK PACKING
CHUTE LINING
HOSE COUPLINGS, CLAMPS

LIQUID CORROSION-RESISTANT LININGS

GOODALL WATERPROOF FOOTWEAR and CLOTHING

Famous for Quality, Comfort and Long Wear

"TOE-SAVER"® BOOTS

Smooth, tough, flexible jet black rubber, heavy duck lined. Cushion insole. White cap over reinforced steel toe tested to withstand 2,000 lbs. pressure. Tread-sole. Hip, Style MB-346. Storm King, Style MB780. Short, Style MB946.

"WEAR KING"® BOOTS—Identical in quality with above, but without "Toe-Saver." Hip, Style MB345. Storm King, Style MB799. Short, Style MB945.

"RUBBERHIDE" SAFETY INNERSOLES. Sheet of high-tensile spring steel bonded between layer of top grade sole leather and layer of rubberized canvas duck. Puncture-proof.



MINER'S PACS Top quality black rubber Lace Pacs, Style ML-975, 16" high; Style ML-760, 15" high. Cushion insole. Cleated outsole. "Toe-Saver" Safety Toe. Also non-lace "Terra Haute" pacs, Style ML-271, in otherwise same construction. Other boots, workshoes, arctics and rubbers, built for extra wear and comfort.

COATS, JACKETS, OVERALLS

Items too numerous to describe here, in rubber, oiled and latex... all designed to afford maximum protection plus comfort in every kind of work. Style 338 coat is a long-time favorite... double back; corduroy-lined collar; length 49".

SAFETY HATS

"Hardboiled" Safety Hats in fibre glass and aluminum. Easiest to wear, yet providing maximum protection. Also, miners' caps, with or without lamp brackets.



TUNNEL SUITS

Style 80 jacket with Style 81 Overall makes the ideal suit for underground work. Other suit combinations to meet every preference or need.



★ ★ ★
Write for catalog describing the complete Goodall clothing and footwear line.



Loading the Tournapull Rear-Dump to capacity, with blasted ore, takes this $2\frac{1}{2}$ -cubic yard shovel about 4 minutes. Tournapull's large bowl opening and low rear-entry simplify loading and reduce spillings.

Mining dolomite for ISCOR

South African Iron and Steel Corporation, Pretoria, Transvaal, South Africa, produces more than 1,465,000 tons of ingot steel annually at its Pretoria and Venderbijlpark steel mills. Daily steel production amounts to better than 4,000 tons.

Every ton of ingot steel produced requires about 800 pounds of high-grade metallurgical dolomite. This mineral is needed as a fluxing agent to convert iron ore into pig iron. At ISCOR's plants, some dolomite is also needed for lining furnace hearths and covering refractory bricks.

Steel mill operates dolomite pits

To maintain and expand its steel production, ISCOR needs substantial and always dependable supplies of dolomite. In assuring this supply, the Company maintains and operates two quarries of its own.

From one of these pits, south of Pretoria, as much as 2,000 tons of graded metallurgical dolomite is removed in a 16-hour day.

Helping to haul this raw dolomite ore, from the quarry to the crushing plant, is a 22-ton Model C Tournapull Rear-Dump. This machine regularly hauls blasted ore 8/10 mile, in an average of $4\frac{1}{2}$ minutes, over roads with gradients of 1 to 12. Traveling typical 1.6-mile cycles, the Rear-Dump delivers capacity loads of raw ore every $12\frac{1}{3}$ minutes.

Repair service available

R. Alberts, Chief Mining Engineer at the quarry, notes that the Company's Tournapull "operates satisfactorily" on a 96-hour weekly schedule. He is also pleased because Tournapull parts and service are so readily available in the Transvaal.

LeTourneau-Westinghouse Tournapull Rear-Dumps are built in 3 sizes, with capacities of 11, 22, and 35 tons. May we suggest you write for complete information on these modern high-speed haulers? We shall be pleased to send you an illustrated bulletin and full specifications.

Tournapull—Trademark Reg. U.S. Pat. Off. CR-1806-QJ-1r



At the touch of an electric dashboard switch, the Rear-Dump body lifts, swings low behind rear wheels, to dump its full load into a crusher hopper or over the edge of a bank. This Tournapull can dump a full load of dolomite in about $\frac{1}{2}$ minute. Two-way power control permits slow tilting for spreading load or gradual dumping when desired.



Loaded Rear-Dump starts the haul up 8% grades out of the pit. Tournapulls travel at speeds up to 32 mph, can drive over highways, rough haul roads or across open country. This machine, for example, drove 36 miles from Johannesburg to the quarry south of Pretoria.

You will do more work at less cost with LeTourneau-Westinghouse equipment



TOURNAPULL REAR-DUMPS: Available in 3 heavy-duty sizes for dependable off-road hauling. B Rear-Dump carries 35 tons (31.7 met. tons), choice of 300 hp diesel engine with sliding-gear transmission, or 335 hp engine with torque converter. Top forward speed is 30 mph (48.2 kph). C Rear-Dump has 22-ton (20-met.-ton) capacity; 210 hp diesel engine with sliding-gear or constant-mesh transmission. Travel speeds are as high as 32.1 mph (51.6 kph). D Rear-Dump carries 11 tons (10 met. tons). Its engine is rated at 138 hp. Manual transmission is standard. Machine travels at forward speeds to 29.5 mph (47.4 kph).

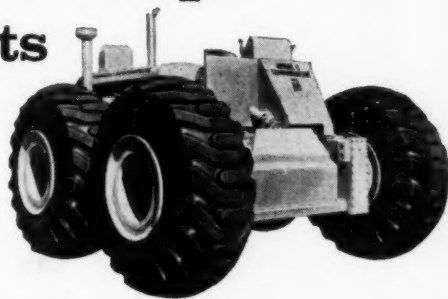


TOURNAPULL SCRAPERS: Scrapers for Tournapull prime-movers are available in 3 sizes: B Fullpak, 27 yd³ (20.6 m³) capacity; C Fullpak, 18 yd³ (13.7 m³); and D Tournapull, 9 yd³ (6.8 m³). These scrapers are interchangeable with Rear-Dump, Bottom-Dump, Flatbed, or lift-and-carry Crane.

These mining machines will help reduce your operating costs

For the exacting requirements of mining, you need strongly built, dependable machinery. And for minimum costs, you need fast-working machinery as well. Strength, dependability, speed and effective use of power are built into every unit of the LeTourneau-Westinghouse line: Tournapull scrapers, Rear-Dumps, Tournatractors, and Adams model graders.

Check the economical production ability you get with these modern machines. Study the specifications. Ask for complete facts on the type of units which can be used profitably in your operations.



C TOURNATRACTOR: This 210 hp, rubber-tired tractor travels anywhere under its own power, at speeds to 17.2 mph (27.6 kph) forward, and to 7.2 mph (11.5 kph) in reverse. Attachments include: dozer blade, Angledozer, root rake, push-block, power-control-unit, winch, side boom, tree stinger, rail coupler, and snow plow. Tournatractor tows sheeps-foot rollers, scrapers, roofers and other equipment.



ADAMS MODEL MOTOR GRADERS: These are available in seven models, with hp from 60 to 190. Standard models of heavy-duty type have eight forward speeds to 26 mph (41.8 kph), four reverse speeds to 13 mph (20.9 kph). A gear assembly for three extra low speeds is optional. The POWER-Flow 660 has 190 hp engine with torque converter. It has forward speeds to 27.4 mph (44 kph). The LeTourneau-Westinghouse POWER-Flow 550 has 135 hp with torque converter. The handy 60 hp "220" has forward speeds to 18.3, reverse to 3.2 mph. Attachments for grader line include: snow plow, wing, "Snow-Blow" attachment for wing, scarifier, power-shift moldboard, bulldozer, rotary snow plow, and Jebco Elegrader (for sidcasting materials). The LeTourneau-Westinghouse Adams Model Traveloader picks up windrowed material for casting into trucks. POWER-Flow, Tournapull, Tournatractor, Angledozer, Fullpak—Trademark Reg. U.S. Pat. Off.; Adams—Trademark LA-1796-M-1m

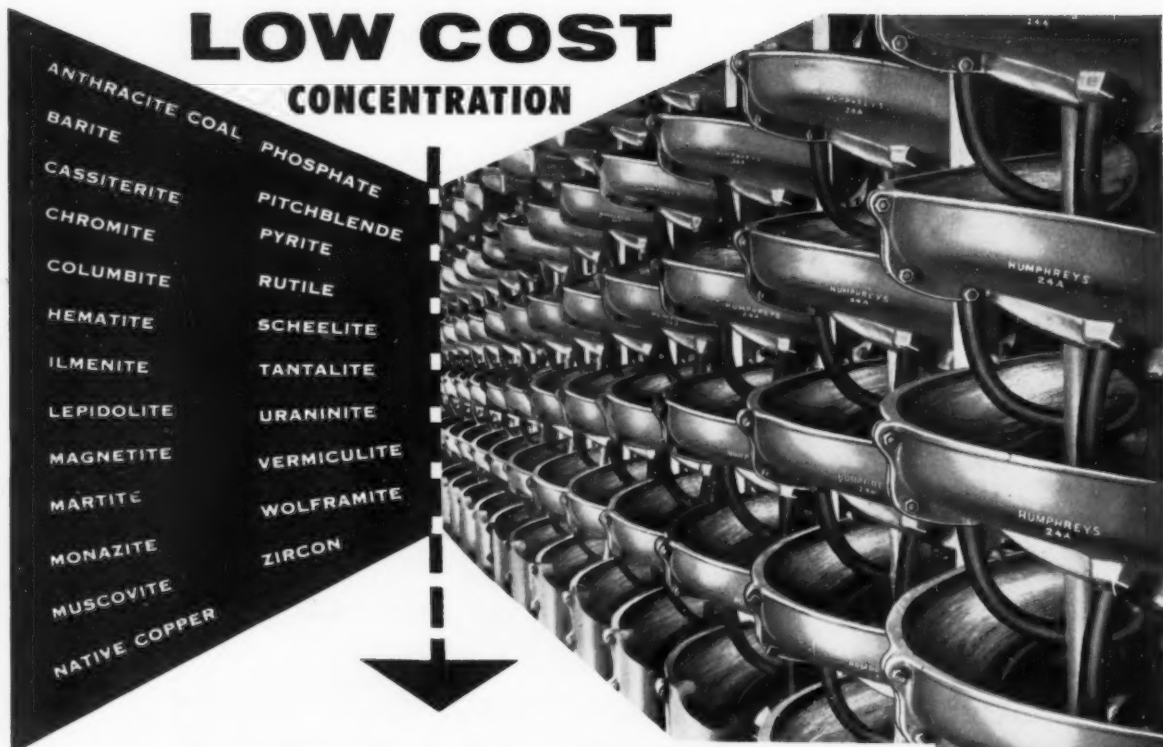


LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

LOW COST CONCENTRATION



ANTHRACITE COAL
BARITE
CASSITERITE
CHROMITE
COLUMBITES
HEMATITE
ILMENITE
LEPIDOLITE
MAGNETITE
MARTITE
MONAZITE
MUSCOVITE
NATIVE COPPER
PHOSPHATE
PITCHBLLENDE
PYRITE
RUTILE
SCHEELITE
TANTALITE
URANINITE
VERMICULITE
WOLFRAMITE
ZIRCON

HUMPHREYS SPIRAL CONCENTRATORS

**HAVE ECONOMICALLY RECOVERED THE
MINERALS LISTED ABOVE**

Low cost concentration becomes a reality when you install Humphreys Spirals. Economy-minded mineral producers the world over prize these efficient concentrators, their economical installation, low maintenance costs and year-round trouble-free operation. No moving parts. Small floor space.

APPLICATIONS:

Production of a finished concentrate.

Production of a bulk concentrate of several minerals and a finished tailing in one or more stages.

Scavenging the tailing from another process for the recovery of heavy minerals.

Write today for information on metallurgical tests of your ore samples for spiral treatment.

HUMPHREYS ENGINEERING COMPANY

913 FIRST NATIONAL BANK BLDG. • DENVER 2, COLORADO

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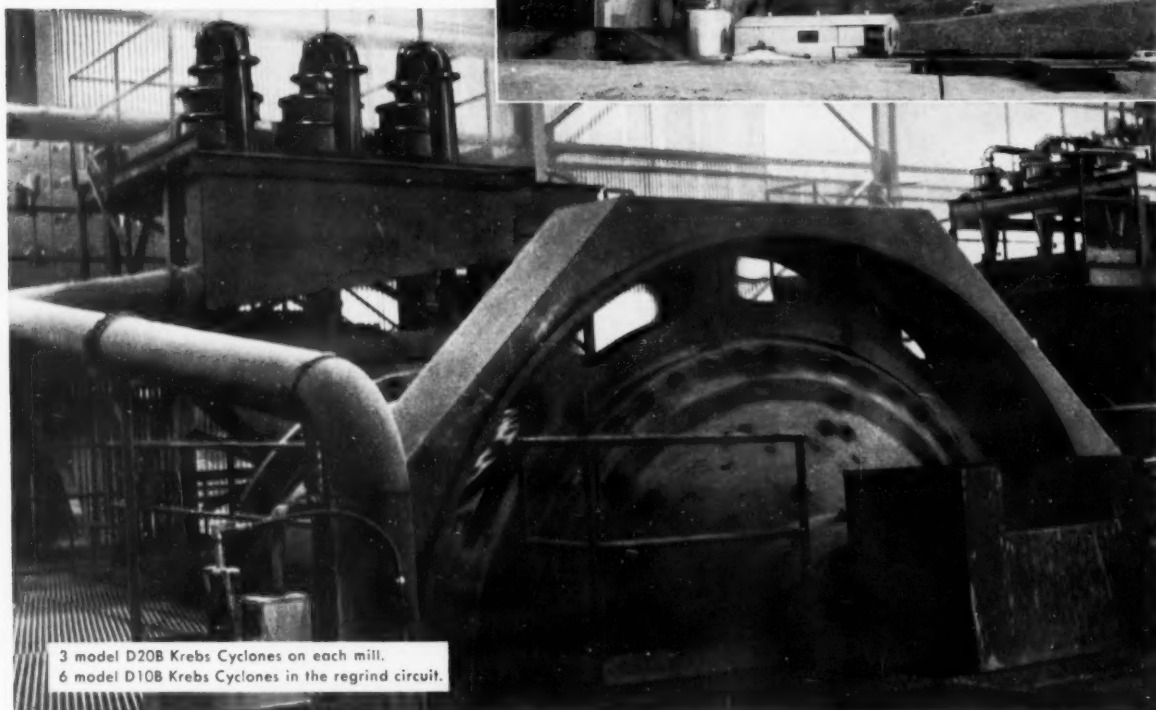
EDWARD L. BATEMAN LTD.
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SWEDEN:

SALA MASKINFABRIKS A-B,
SALA

SALES AGENT—ENGLAND: THE GENERAL ELECTRIC CO., LTD. (FRASER & CHALMERS ENGINEERING WORKS) ERITH, KENT

New copper concentrator does all its classification with cyclones



3 model D20B Krebs Cyclones on each mill.
6 model D10B Krebs Cyclones in the regrind circuit.

Pima Mining Company's Arizona plant, starting up in late 1956, is the first U. S. copper concentrator to classify entirely with cyclones.

Pima and nine other U. S. and foreign copper concentrators now have Krebs Cyclones for all or a major part of their tonnage. Operational costs can be substantially lower than with conventional classifiers. Capital cost is about 30%. The metallurgical advantages are usually the primary consideration . . . the flotation engineer may now have an optimum pulp density, and a selective grind of middling grains that reflects in increased concentrate grade as well as lower tailings.

Krebs Cyclone Bulletin 830 describing further cyclone techniques is available on request.



EQUIPMENT ENGINEERS INC.

41 SUTTER STREET

SAN FRANCISCO 4, CALIFORNIA

Manufacturers of Krebs Cyclones, Valves and Clarkson Feeders

CHRISTENSEN

Diamond Products Equipment

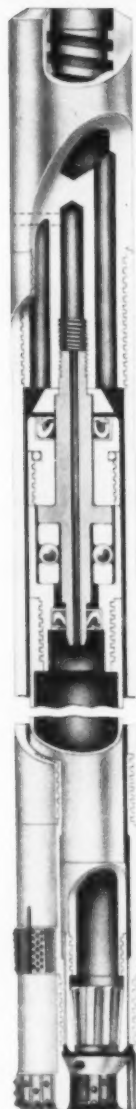
*Engineered to YOUR
Formation*

**FOR
ANY
DIAMOND
DRILLING
PROBLEM**

FOR HARD, ABRASIVE FORMATIONS

Chrome-Plated Barrel

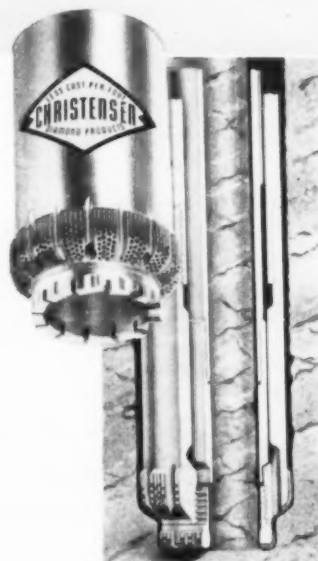
Chrome-plating the inside of the inner tube of the Christensen core barrel gives an extremely hard, smooth surface, allowing core to enter freely and reducing to an absolute minimum the tendency of core to wedge and block.

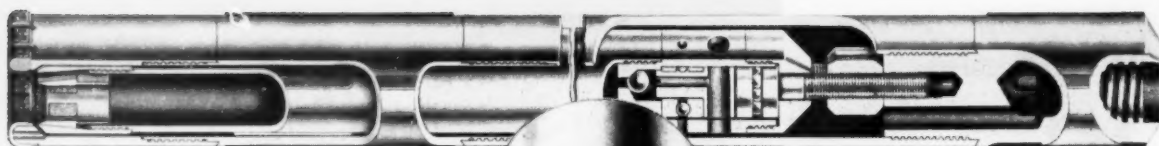


FOR SOFT, STICKY FORMATIONS

Core recovery rates in soft, friable and poorly consolidated formations have been increased greatly by the application of the long-nose pilot bit (shown at right) allowing the driller to core *ahead* of circulation, preventing contact of drilling fluid with the core and alleviating washing problems.

Pilot section may be set with diamonds or tungsten carbide inserts as illustrated.





FOR GENERAL PURPOSE CORING

Standard core bit, used in conjunction with Christensen series C-2 core barrel, has proven very successful in a variety of formations. Remember, each Christensen bit is matched to the formation by varying diamond size, concentration and number of waterways.



SPECIALTY DIAMOND TOOLS



Thin-Wall Concrete Bits—Ideal for recovering concrete cores and for drilling holes in other material when cores are not required.

NON-CORING BITS

Variations of concave diamond bits are used profitably for drilling where no core is desired—such as barren rock (to reach pay zones), blast holes, drain holes and grout holes.



Small Diamond Bits and Shells — These smaller bits and shells have become very popular for short hole prospect drilling. Variety of styles and sizes available.



Wire Line Diamond Bits — Step type design results in combination coring-reaming action; helps remove cuttings; gives faster penetration rates, increased stabilization and longer bit life.

The Christensen Engineer

is on call at any time for advice on any diamond drilling problem. His education and experience qualify him well for on-the-job consultation and to supply the diamond bits and barrels, matched to your formation, that are designed to give the best results under any conditions. Call the Christensen engineer today and operate at "less cost per foot."

*Do you have our latest catalog?
Write today for SD 507-57*

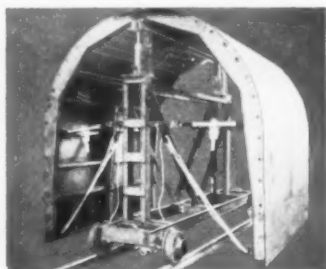
FREE FILMS

Christensen has available, free of charge, two 16 mm. color and sound films on diamond mining in South Africa and the use of diamond bits in the drilling industry, for showing at association meetings or conventions. Write today for your play-date of these interesting films.

CHRISTENSEN DIAMOND PRODUCTS



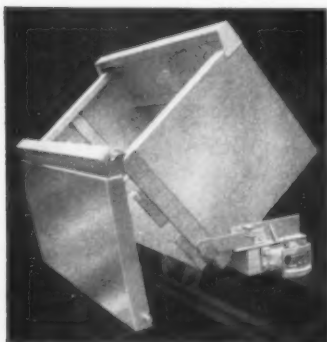
P. O. BOX 387 • SALT LAKE CITY, UTAH



MAYO TELESCOPIC STEEL DRIFT FORM built for the main haulage tunnel, 10' x 11', of an important Pennsylvania iron mine. Other Mayo steel forms, designed for specific jobs in other parts of the world, include: telescopic, non-telescopic, separate sidewall and arch, single unit, full round forms for monolithic pours, etc.



MAYO HEAD FRAMES—for deep or shallow shafts. **MAYO SINKING FRAMES**—for quick erection and dismantling. Each designed and built for specific installations. Depend on Mayo's world-wide experience to provide the most practical answer to your problem.



MAYO MINE CARS are of several types. Illustrated is a 2½ cu. yd. Side Dump Car, 24" gage of the Granby type. Rocker Dump cars also available. All Mayo cars can be equipped with the Mayo automatic coupler.



**YOU CAN
DEPEND ON**

MAYO

**TUNNEL and MINE
EQUIPMENT**

... based on over 25 years of specialized design and construction experience

... proved in use in every part of the world. For more complete information, send for **FREE, 8-PAGE BULLETIN NO. 22**

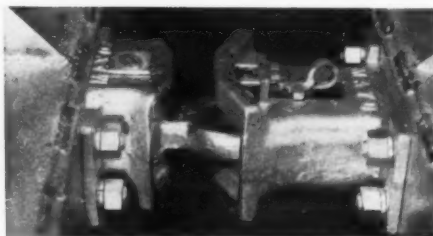
SPECIAL EQUIPMENT DEVELOPED FOR SPECIAL PROBLEMS



MAYO CAR PASSERS require only one man to operate, two to carry. Low in first cost, they're safe and efficient in use.



MAYO PNEUMATIC GROUTERS have proved dependable, efficient machines for placing low pressure grout in tunnels, mines, shafts and sub-grades. Readily convertible for shooting Pea or Birds-Eye gravel. Always kept in stock for immediate shipment.



... the coupler with the mating instinct **MAYO AUTOMATIC COUPLERS** for Mine Cars couple instantly on tangent or curves. Safe, self-centering link completely eliminates all hazards of hand coupling ... more than pays for itself by preventing accidents. Easily bolted to existing cars.



MAYO

**TUNNEL and MINE
EQUIPMENT**

LANCASTER, PA., U.S.A.

- Skips and Cages
- Kibbles and Gilleys
- Drill Jumbos
- Air Locks
- Tunnel Shields
- Mine Locomotives



NEW ECONOMY...with DRAVO-SCHENCK vibrating screens—feeders—conveyors

Through an exclusive agreement, Dravo Corporation is now licensed to manufacture vibro-conveyor equipment based on the original designs developed and patented by the Carl Schenck Company of Darmstadt, Germany.

Employing a unique mechanically operated "Micro Thrust" exciter unit, these units provide trouble free operation and low maintenance costs. Dravo-Schenck screens, feeders and conveyors have a wide variety of applications in the handling of ferrous and non-ferrous

ores, sinter, chemicals, cement clinker, crushed stone, coal, abrasive or other difficult-to-handle material. Also available is a helical type conveyor which operates vertically in a space saving spiral and handles bulk material up to four inches in diameter.

Our engineers will be glad to confer with you on specific problems. Complete information on this equipment is available. Write for Bulletin No. 1475, Dravo Corporation, Pittsburgh 22, Pennsylvania.

DRAVO
CORPORATION



Blast furnace blowers • boiler and power plants • bridge sub-structures • cab conditioners • docks and unloaders • dredging • fabricated piping foundations • gantry and floating cranes • gas and oil pumping stations • locks and dams • ore and coal bridges • process equipment • pumphouses and intakes • river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

NORDBERG MACHINERY

...engineered for
large volume, quality
production of ores and
industrial minerals

The entire line of heavy-duty Nordberg Mining Machinery has been engineered and built for one basic purpose . . . to meet the mining industry's expanding demand for low cost, quality production and processing of large tonnages of metallic and non-metallic ores and industrial minerals.

The many years of specialized experience gained by Nordberg in working closely with the mining fraternity has resulted in continual design and operational improvements which have consistently made Nordberg Machinery first choice among the world's leading ore and mineral producers.

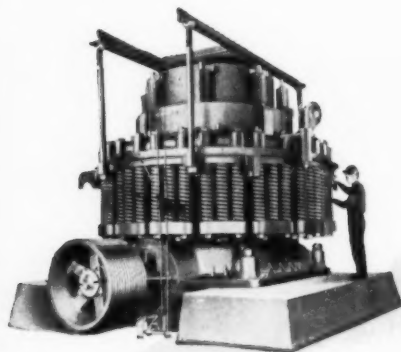
As illustrated, Nordberg Mining Machinery includes Symons® Gyratory Crushers for primary breaking, Symons Cone Crushers for secondary and tertiary crushing, Nordberg Mills for wet or dry grinding, Symons Vibrating Grizzlies and Screens for scalping and sizing, and Nordberg Engines for mine and mill power.

Write for literature on the Nordberg Machinery you need to efficiently produce large tonnages of ores and industrial minerals at lower cost per ton.

SYMONS A Registered Nordberg
Trademark known throughout the world

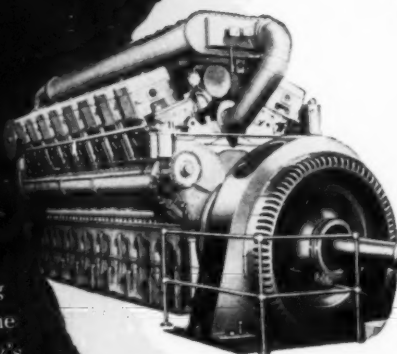
NORDBERG MFG. CO.

Milwaukee, Wisconsin



SYMONS CONE CRUSHERS

Built in both Standard and Short Head types, in sizes from 22" to 7' in diameter, in capacities from 6 to 900 or more tons per hour.



NORDBERG ENGINES

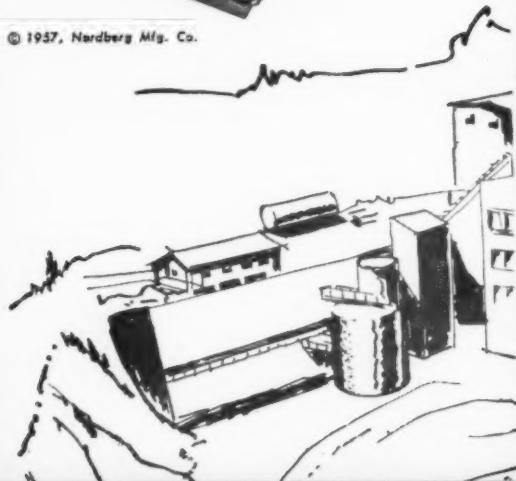
Ranging from small power units to large stationary engines. Nordberg engines are built in types for Diesel, Duafuel® and Spark-Ignition Gas operation, in sizes to over 12,000 horsepower.

SYMONS ROD DECK SCREENS

Highly efficient screening surface of spring steel rods—easily replaced. Especially suited for wet, sticky materials.



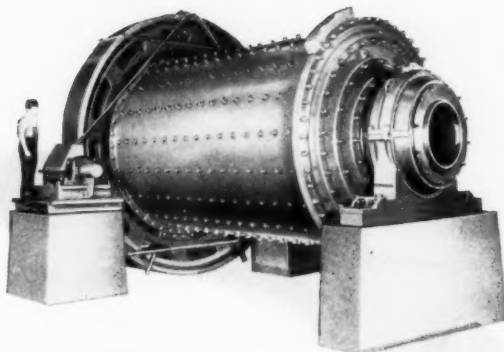
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SYMONS® PRIMARY GYRATORY CRUSHERS

Built in 30", 42", 48", 54", 60" and 72" feed opening sizes, for capacities to 3500 or more tons per hour.

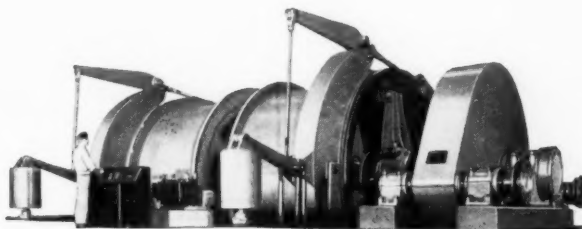


NORDBERG GRINDING MILLS

Built for wet or dry, open or closed circuit operation . . . including Rod, Ball, Pebble, Tube and Compartment types, in sizes from 6' to 13' dia., up to 50' in length.

NORDBERG MINE HOISTS

Built in both friction and drum types for hoisting both ore and men. These dependable hoists are widely used in large coal and metal mining operations.

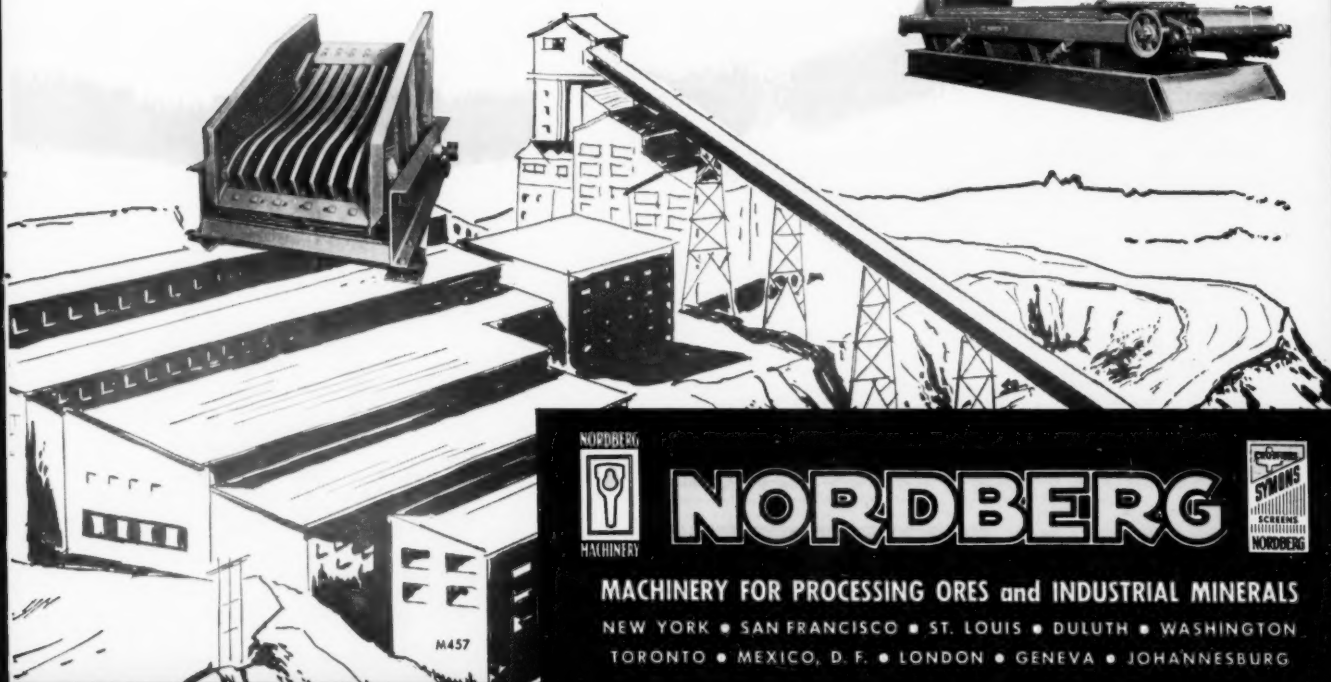
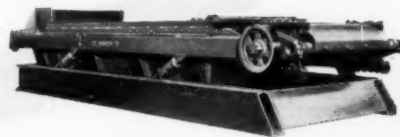


SYMONS VIBRATING BAR GRIZZLIES

Built for heavy duty large capacity primary scalping service. Particularly effective when handling wet, sticky or gummy ores.

SYMONS HORIZONTAL VIBRATING SCREENS

Permit level, large capacity screening of extreme accuracy. Built in single, double and triple deck types in a wide range of widths and lengths.



NORDBERG



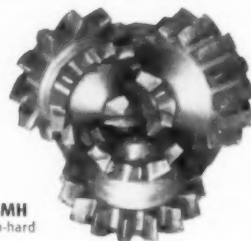
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more efficient drilling
in harder formations



TYPE BD-M
for medium
formations



TYPE BD-MH
for medium-hard
formations



TYPE BD-H
for harder
non-abrasive
formations



TYPE BD-AH
for extremely
hard, abrasive
formations

THE NEW "BLUE DEMON" THREE CONE ROCK BITS IN THE MOST POPULAR DRILLING SIZES

3 7/8" through 5 1/2"

The Hawthorne "Blue Demon" Cone-Type Rock Bit is a high quality, precision made rotary bit for minerals exploration and mining and quarry blast hole drilling.

Available in four formation types, in popular sizes from 3 7/8" through 5 1/2", these three-cone bits are manufactured from high-hardness steel alloy, which has superior wear-resistant properties after heat-treating. Head sections and cone bearings are uniformly machined on Hawthorne's high-precision automatic equipment, with roller and bearing faces machined and ground perfectly concentric.

A special hard-facing process bonds a combination of tungsten carbides and other high abrasive resistant alloys, of exceptional hardness, to the cutter surfaces, for exceptional cutting speed and long bit life.

For complete details about the Hawthorne "Blue Demon" Cone-Type Bits, and the "Blue Demon" line of Replaceable Blade Exploration Bits, write for illustrated Catalog 658.

PRICE LIST — HAWTHORNE "BLUE DEMON" THREE-CONE ROCK BITS

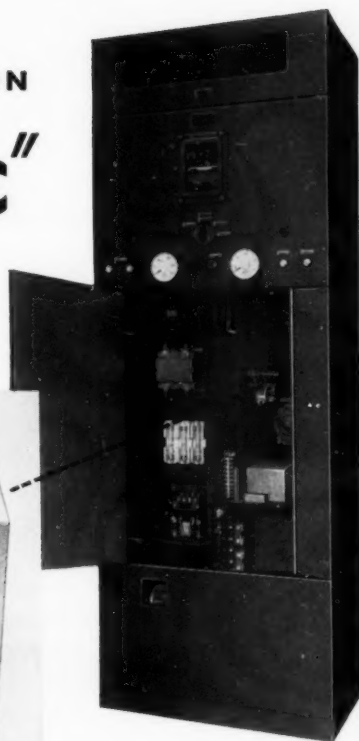
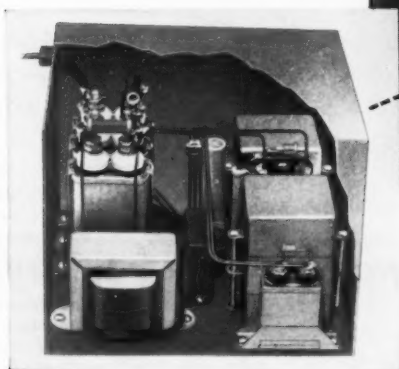
Bit Size (in.)	Pin Size API Reg. (in.)	TYPES RECOMMENDED				Approx. Net Weight (lbs.)	Net* Price
		For Medium Formations	For Medium- Hard Formations	For Harder Non- Abrasive Formations	For Extremely Hard, Abrasive Formations		
3 7/8	2 3/8	BD-MA or W	BD-MHA or W	BD-HA or W	-----	8	\$ 52.50
4 1/4	2 3/8	BD-MA or W	BD-MHA or W	BD-HA or W	-----	9	52.50
4 1/2	2 3/8	BD-MA or W	BD-MHA or W	BD-HA or W	-----	10	55.00
4 3/4	2 7/8	BD-MA or W	BD-MHA or W	BD-HA or W	-----	12	60.00
		-----	-----	-----	BD-AHA or W		65.00
5 1/2	3 1/2	BD-MA or W	BD-MHA or W	BD-HA or W	-----	20	98.00
		-----	-----	-----	BD-AHA or W		103.00

FOOTNOTE: A and W references are types for air or water drilling. Specify type desired when ordering. *Prices slightly higher in Canada and Alaska.

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THE WESTERN PRECIPITATION
"Transistomatic"
CONTROL



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the
Industry's
Most
Advanced
Precipitator
Control...*

NO TUBES! NO RELAYS! NO COUNTERS!

and carries a Lifetime Guarantee!

In the electrostatic precipitation of dust, fume and fly ash, no installation is completely modern without automatic control to maintain optimum Precipitator efficiency as the characteristics of the gas stream fluctuate. Compared with manual control, automatic control is not only more sensitive and more efficient, but actually costs less because of the vital savings it makes in labor and operating costs... *savings so important that no profit-minded operator will want to be without them.*

But the important point to remember is this—

Although many manufacturers of precipitation equipment offer units for precipitator automation, no other unit is equal to the "Transistomatic" Control for foolproof simplicity, rugged dependability or control accuracy!

These are not idle claims. They can be easily verified by making your own comparison...



A DESCRIPTIVE BOOKLET

that gives further information
will gladly be sent on request.
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Compare **ACCURACY!** The "Transistomatic" does not base its "sensing" action on spark frequency alone—or spark intensity alone. Instead, it continuously integrates BOTH frequency and intensity to establish an overall "power value" that provides a new standard of control accuracy!

Compare **DEPENDABILITY!** The "Transistomatic" unit contains no parts of any kind requiring regular replacement. Moreover, the entire unit is completely sealed—moisture-proof and watertight.

Compare **GUARANTEES!** The "Transistomatic" is so foolproof and trouble-free it carries a lifetime guarantee!

BEFORE YOU BUY ANY automatic precipitator control, be sure to get the complete "Transistomatic" story. A folder is available giving additional data. Or see your nearest Western Precipitation representative for further details!



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Engineers and Constructors of Equipment for Collection of Suspended Material from Gases... and Equipment for the Process Industries
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Electrical equipment and supplies to meet the special needs of the mining industry are an important part of Graybar's all-inclusive service. Located at or near leading mining centers, Graybar offices and warehouses serve as prompt local supply sources for the

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Simplex mining machine cable has tough outer selenium-neoprene armor to stand up in mining service.



Tirex shot-firing cable combines flexibility and light weight with high strength.



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Lamps and lighting equipment offered via GRAYBAR include explosion-proof, vaporproof and other specially protected types. Also a full line of floodlights for outdoor service, fluorescents for offices and drafting rooms. Our portables and flashlights are listed by Underwriters Laboratories for Class I, Group D conditions.



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Shown dumping its big pay load of iron ore at a loading platform in Venezuela, this 802-B is one of a fleet of Kenworth rock and ore movers operated at Orinoco Mining Company concessions.



48-Ton Kenworth 802-B's Haul Iron Ore in Venezuela

From the crests of southeastern Venezuela's hills and ridges, giant Kenworth Model 802-B's are moving tons of high-grade iron ore for the Orinoco Mining Company, a subsidiary of United States Steel Corporation.

Hauling from Orinoco Mining Company's Altamira-Rondon-Arimagua mining concessions, they carry ore to an ore-gathering system loading platform for subsequent shipment to Puerto Ordaz. Equipment to mine and haul approximately 500,000 metric tons of ore a year is assigned to the Altamira-Rondon and Altamira-Arimagua production.

The mines are only part of a massive project which spans years of development work by the Orinoco firm. Its activities have included the construction of roads, docks, airfields and a railroad; the dredging of a deep-water channel to the sea; and the construction of two complete model communities—Puerto Ordaz and Ciudad Piar.



Typical of the rugged Kenworths in action in Venezuela, this 802-B is equipped with power steering and oversized brakes.

The company's Kenworths are built on a big scale, too—48-ton units with a truck capacity of 32 cubic yards each. For extra-strength, their rigid, variable-section frames are 15½ inches deep at the point of greatest loaded stress. Channel side members are machine welded of carbon steel plate. Axles, too, are engineered for over-capacity. Dump bodies, of Cor-ten and Man-ten steel alloys, have double construction with

steel channels welded between wrap-sheets and lining-plates.

Built to move in and out of tight corners, these spring-mounted semi's combine wide-track axles with comparatively short tractor wheelbases of 168½

The Kenworth 802-B has a dumping angle of 60 degrees. Its dumping action moves the tractor backward and under the trailer while the front of the trailer raises. Kenworth-patented, telescopic hoists are fast-acting, two-cylinder, straddle-mounted with single-lever, three-position controls. Rugged pin-type construction of the fifth wheel provides stability in dumping and in over-the-road hauling.

Each Kenworth in service for Orinoco Mining Company is powered with a 335-horsepower diesel engine, has a torque converter and three-speed torque transmission with hydraulic braking, air starter, nickel-cadmium batteries and tubeless tires.



KENWORTH

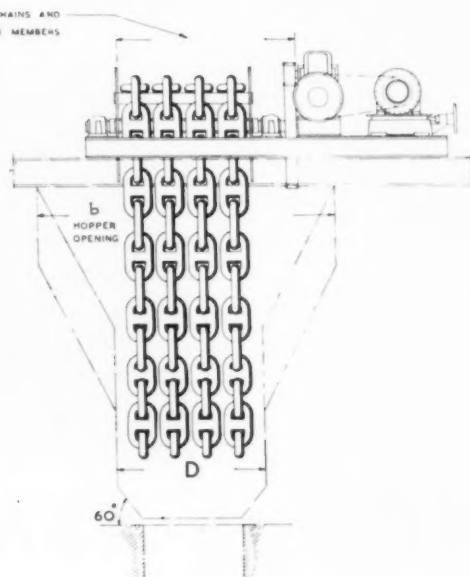
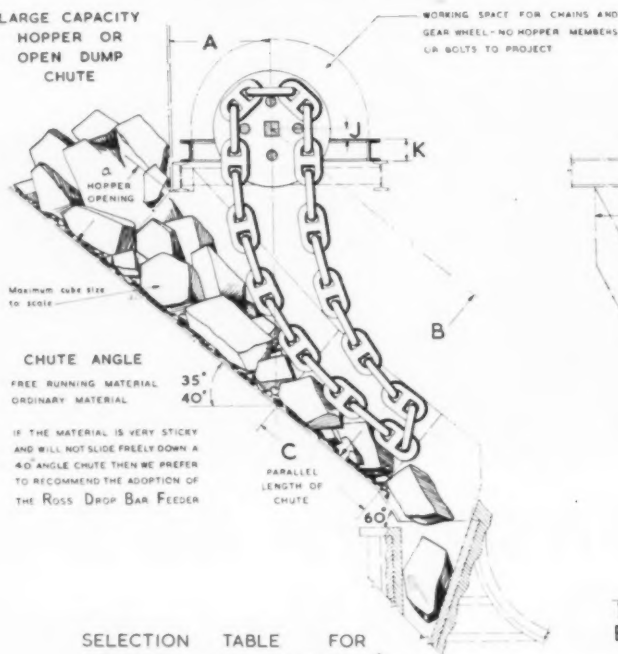
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NEW DESIGN OF ROSS PATENT CHAIN FEEDERS

LARGE CAPACITY
HOPPER OR
OPEN DUMP
CHUTE



SELECTION TABLE FOR
PRIMARY JAW CRUSHERS *

FEEDER SIZE	DIMENSIONS IN INCHES						WEIGHT IN CWTS	SCALE
	MAXIMUM PIECES		CRUSHER MOUTH <small>Select nearest standard size</small>	HOPPER OPENING				
	CUBE	OCCASIONAL SLAB		a.	b.			
3 W	9	9, 13, 18	18 x 12	18	54	23	1/30	
4 W	12	12, 18, 24	24 x 16	24	72	48	1/40	
5 W	15	15, 22, 30	30 x 20	30	90	85	1/50	
6 W	18	18, 27, 36	36 x 24	36	108	140	1/60	
7 W	21	21, 32, 42	42 x 28	42	126	220	1/70	
8 W	24	24, 36, 48	48 x 32	48	144	325	1/80	
9 W	27	27, 40, 54	54 x 36	54	162	450	1/90	
11 V	33	33x50x66	66 x 44					

* THIS TABLE IS A GUIDE TO JAW CRUSHER INSTALLATIONS. OTHER FEEDING
DUTIES TO WHICH THE ROSS CHAIN FEEDER IS APPLICABLE ARE:-
GYRATORY CRUSHERS HAMMER MILLS ROPEWAYS
CONE CRUSHERS CONVEYORS SKIPS, WAGONS
ROLL CRUSHERS SCREENS AND MINE CARS
REFER DETAILS OF DUTY TO OUR ENGINEERING DEPT. FOR
RECOMMENDATIONS

FEEDER SIZE	DIMENSIONS IN INCHES											
	A	B	C	D	E	F	G	H	J	K	L	
3 W	19	39	24	27	17	19	18	60	2 1/2	4.2	22 1/2	
4 W	24	51	32	36	22	26	24	64	3	5.2	30	
5 W	30	63	40	45	28	32	30	80	3 1/2	6.3	37 1/2	
6 W	36	75	48	54	33	39	36	96	3 1/2	7.3	45	
7 W	42	87	56	63	39	45	42	112	4 1/4	8.3	52 1/2	
8 W	48	99	64	72	44	52	48	128	5	9.3 1/2	60	
9 W	54	111	72	81	50	58	54	144	5 1/2	10.3 1/2	67 1/2	

OTHER "ROSS" UNITS: ROSS DROP BAR GRIZZLY FEEDER
ROSS TWO-ROLL GRIZZLY

ROSS SCREEN & FEEDER CO.
100 QUIMBY STREET
WESTFIELD, N.J., U.S.A.

ROSS ENGINEERS LTD.
11 WALPOLE ROAD
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CANADIAN LICENSEE: DORR-OLIVER-LONG, LTD., ORILLIA, ONTARIO



Skip bucket liners of USS "T-1" Steel cut dead weight, last longer, cost less to replace than the liners previously used.

"T-1" Steel doubles the life of skip bucket liners —reduces weight by ½ ton



Skip hoist at Miami Copper Company Mine, Miami, Arizona, hauls abrasive copper ore up a 1080-foot shaft, making 80 trips per hour.

This skip hoist at the Miami Copper Company Mine, Miami, Arizona, has two skip buckets which weighed 19,350 pounds each. The old liners, made of structural carbon steel, consisted of 1-inch-thick bars riveted to ¾-inch-thick plates. By replacing this arrangement with ½-inch-thick plates of USS "T-1" Steel, weight was reduced by almost half a ton.

The present USS "T-1" Steel front dumping-lip liner and the side liners last more than twice as long as the previous liners. What's more, fabrication costs for a complete lining have been reduced by more than 90%, and replacement time cut to a fraction.

What USS "T-1" Steel can do for you. This versatile steel has a combination of properties unexcelled for mining equipment. It has nearly 3 times the yield strength of structural carbon steel, outstanding resistance to impact abrasion, exceptional toughness, even at temperatures as low as -50°F., and is readily weldable without preheating.

This means you can get rid of dead weight and lower your costs by using USS "T-1" Steel for dippers, sticks, booms, chutes, hoppers, cars, and other equipment. Write for our booklet, "Mining's Metal, USS "T-1" Steel." United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS and "T-1" are registered trademarks



United States Steel

United States Steel Corporation - Pittsburgh
 Columbia-Geneva Steel - San Francisco
 Tennessee Coal & Iron - Fairfield, Alabama
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 United States Steel Export Company

This impressive installation at Kiruna, Sweden, demonstrates a major benefit of ASEA Multi-Rope Friction Hoists: *low initial installation cost.*

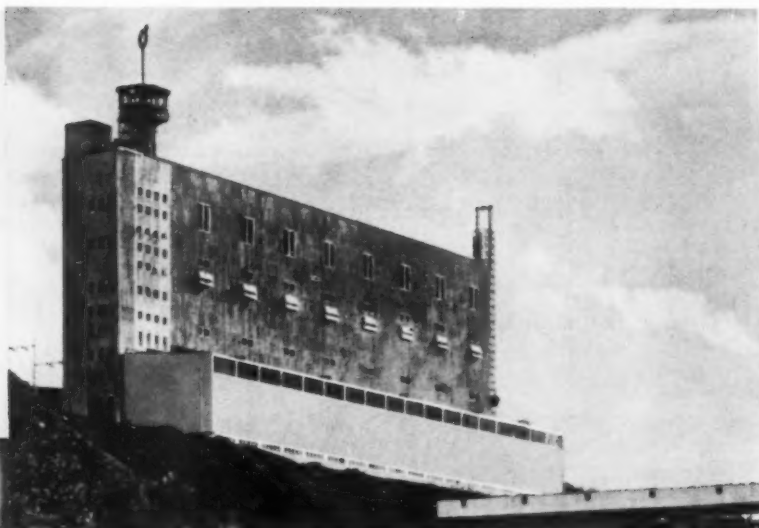
Each of these ASEA Hoists has a skipload of 22 tons and is designed for a depth of 1500 feet, maximum speed 2200 feet per minute.

At Kiruna, as in mining operations throughout the world, ASEA Multi-Rope Hoists prove less costly to operate, safer, and they reduce rope wear.

In the U.S. these advantages may be seen in the ASEA installations of National Potash Co. and Cleveland Cliffs Iron Ore Co.

9 HOISTS IN ONE HEAD FRAME

**Total capacity:
4600 tons
per hour**



FULLY AUTOMATIC, the ASEA Hoists at Kiruna eliminate the employment of hoist men. At U.S. wage rates, assuming two-shift operation, this would mean a saving of about \$30,000 yearly for each hoist!

Write for illustrated literature on ASEA Multi-Rope Friction-Drive Mine Hoists.

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SLURRY CONTROL



BENDIX NUCLEAR DENSITY GAGE AUTOMATICALLY CONTROLS SP. GR.† OF FEED SLURRIES

†Specific Gravity

The fluid content of your slurry can mean the difference between profitable optimum control and costly borderline operation. Down time due to pump failures can be drastically reduced and plugged equipment can be virtually eliminated with the Bendix* Nuclear Density Gage. In processes using kilns to remove water, fuel savings can be realized; where efficient recovery of solids from flue gas or optimum ore separation by Specific Gravity is desired, the Gage can be readily adapted.

Bendix Nuclear Density Gage assures successful processing in metals mining and non-metals mining operations. Control of the fluid or solids content of your slurry can be maintained precisely at any desired point. The measuring element does not contact the slurry, therefore abrasive and corrosive processes can be handled with ease. Control is continuous and automatic.

A complete and accurate record of Specific Gravity is provided as rapidly as the process changes occur. Inadequate sampling techniques and "post mortem" laboratory analyses need no longer be tolerated.

•Applications: Wet slurries in ball mills, rod mills, flue gas recovery systems, dust collectors, flotation, classifiers, thickeners, etc.

Bendix furnishes consulting service for every installation. Write for full details to Cincinnati Division, Dept. 420, 3130 Wasson Road, Cincinnati 8, Ohio.

*TRADEMARK

Export Sales: Bendix International, 205 E. 42nd St., N. Y. 17, N. Y.
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to combat abrasion

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HOPPERS — SKIPS
TABLE DECKS
CONVEYOR BELTS**

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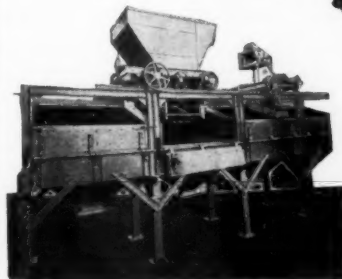
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P.O. DRAWER "D", STAFFORD SPRINGS, CONN.

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with MACE Furnaces and Sintering Hearths

Saves high transportation and treatment charges on your ores and concentrates.

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Standard sizes 5 to 250 tons capacity. Working scale tests on ton lots or larger made at our Denver smelter. Send us an analysis for preliminary report.

The Mace Company

FIRE CONCENTRATION METALLURGISTS

2763 Blake Street, Denver 5, Colo., U.S.A.

KEEP OPERATING COSTS DOWN

WITH

GYROSET

VIBRATING SCREENS TOP PRODUCTION

AND

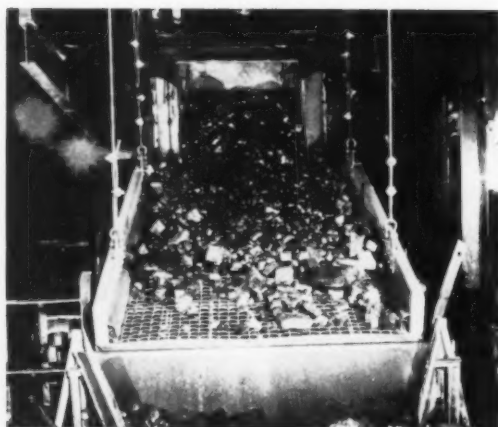
GREATER EFFICIENCY

WHEN

SIZING

AND

DEWATERING

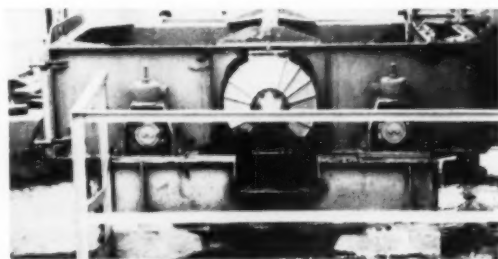


To insure top sizing performance at minimum costs experienced mining operators specify GYROSET SCREENS.

GYROSET Screens can effectively scalp, size or de-water. Due to their adjustable action and their ability to operate at high speed and with any degree of pitch GYROSET Screens will work at a higher capacity than any other screening unit. With positive action GYROSETS can handle dry or wet sizing of ores in a wide variety of sizes at maximum capacity and efficiency.

**POSITIVE ECCENTRIC ACTION
POSITIVE STROKE ADJUSTMENT**
with only 2 bearings

The positive eccentric action of GYROSET Screens gives a full circle throw over the entire length and breadth of the screen surface. With a two-bearing action, movement is achieved with the fewest moving parts.



Construction is simple and rugged. One to Three decks. 18" to 72" in width—4' to 16' in length. Dust tight units available.

THERE IS A GYROSET SCREEN FOR EVERY ORE PROCESSING OPERATION

Write us for full details and complete specifications

PRODUCTIVE EQUIPMENT CORP.

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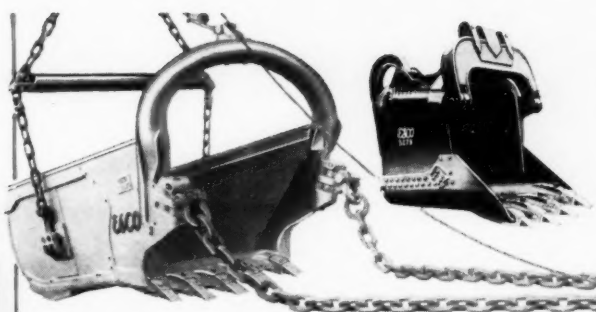
Chicago 12, Illinois



Wear Cap available on large sizes only.

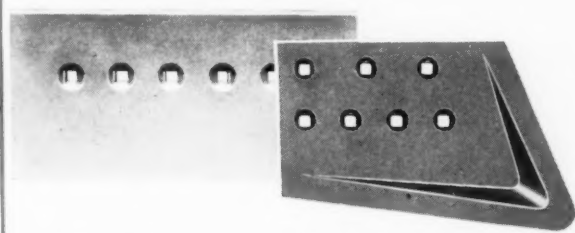
ESCO 12 M Tested Points and Wear Caps More Than Double Performance Life. Cast of ESCO 12 M, ESCO Tested Points and Adapters are metallurgically engineered to the severe conditions of mining operations. ESCO Wear Cap Adapters

are now available with replaceable, slip-on Wear Caps for longer Adapter life. Every ESCO Point is Brinell tested before shipment to assure absolutely correct degree of hardness. ESCO points start sharp, stay sharp longer. Five ESCO Points can be removed and replaced in five minutes, cutting downtime to a minimum.



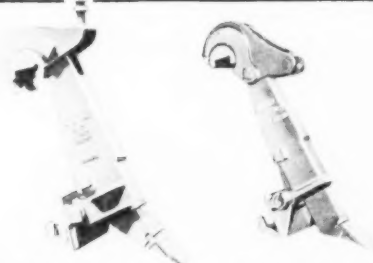
ESCO Dragline Buckets and Dippers Designed For Greater Payload, Less Maintenance. ESCO builds a complete line of dragline buckets, dippers, backhoes and orange-peels. All critical wear points on ESCO buckets are heavy-duty manganese steel castings, highly resistant to shock and abrasion of rugged mining operations.

All ESCO buckets are metallurgically tailored for extra strength with less weight, and designed for greater payload and sharply reduced maintenance. Special loading dippers or draglines can be built to your specifications. ESCO also manufactures a complete line of solid-cast chain and dragline replacement parts.



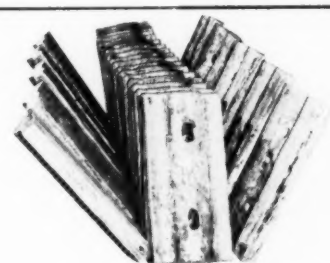
ESCO Cutting Edges and End Bits Last Longer on Tough Mining Jobs. The shock and pounding of rough work actually makes the surface of an ESCO Cutting Edge more wear

resistant—yet the core retains high impact toughness regardless of age or usage—even in sub-zero temperatures. ESCO End Bits stay on the job longer—even in sand and extremely abrasive material—because they are cast of ESCO 12 M.



ESCO Dozer Rooter® Rips Rock, Hardpan, Cuts Stripping Costs Up To 50%. An ESCO Buck Forte Dozer Rooter outperforms a drawbar ripper, minimizes powder work by ripping through hardpan, rock, coal

and shale. Easily installed by one man on the blade of a straight or angled dozer. Rooting depth is adjustable. An ESCO Dozer Rooter is portable enough to carry on the tractor from one area to another. Sizes available to fit any dozer or angle dozer.



ESCO Castings For Every Mining Requirement. ESCO can furnish impellers, rabble arms, roaster arms, chute liners, grates, special valves, conveying chain, ball mill liners, mill

hammers or any special castings. ESCO has complete foundry facilities for static, centrifugal or shell castings of any size, shape or quantity in a wide range of alloys. Complete application engineering service available if needed.

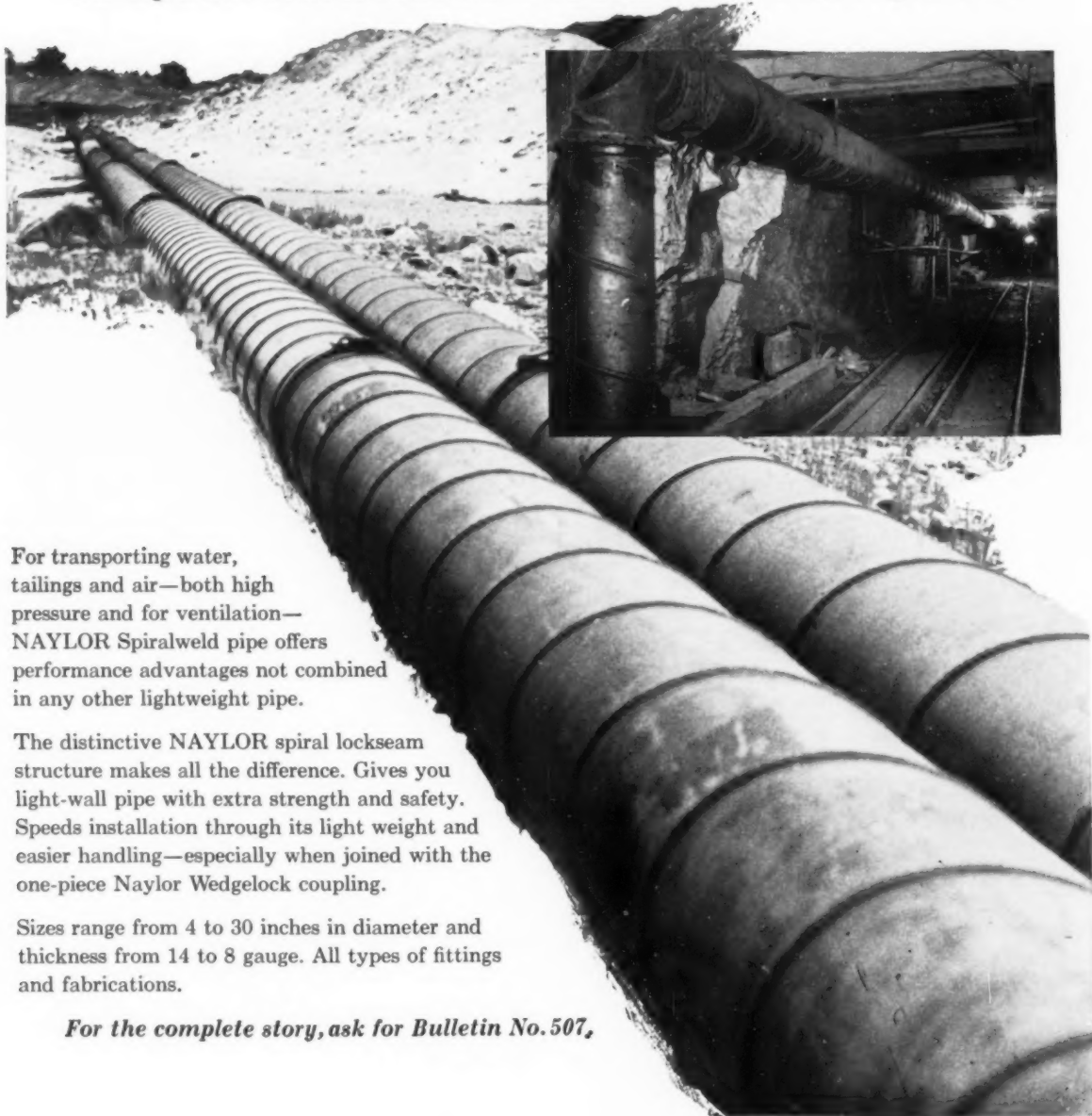
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MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y.
IN CANADA ESCO LIMITED

LOW-COST TRANSPORTATION SYSTEM

To Speed Work Above Ground and Underground

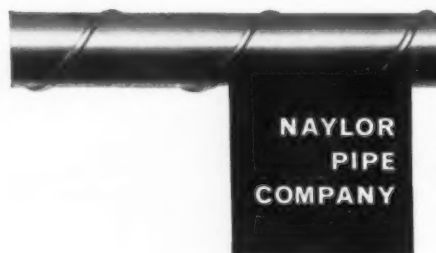


For transporting water, tailings and air—both high pressure and for ventilation—NAYLOR Spiralweld pipe offers performance advantages not combined in any other lightweight pipe.

The distinctive NAYLOR spiral lockseam structure makes all the difference. Gives you light-wall pipe with extra strength and safety. Speeds installation through its light weight and easier handling—especially when joined with the one-piece Naylor Wedgelock coupling.

Sizes range from 4 to 30 inches in diameter and thickness from 14 to 8 gauge. All types of fittings and fabrications.

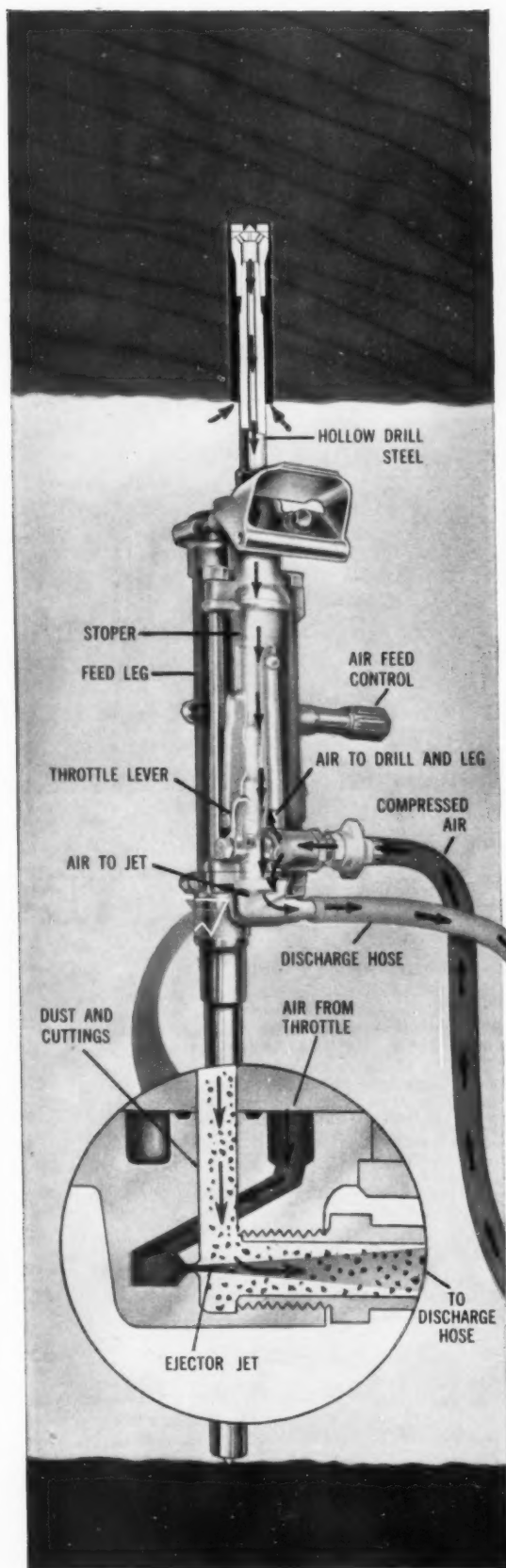
For the complete story, ask for Bulletin No. 507,



NAYLOR

1242 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office • 60 East 42nd Street, New York 17, N. Y.



Only the Ingersoll-Rand

VACUJET

DUSTLESS STOPPER

offers all these
cost-saving advantages
for roof bolting

Designed from the ground up for dry dustless drilling, with built-in jet vacuum and pressure discharge, the Ingersoll-Rand RP38E VACUJET dustless stopper is setting entirely new standards of performance and economy. Here's why:

Strongest Suction Power — vacuum is produced, right in the drill itself — not 25' away. Will even remove cuttings on horizontal holes!

Dust Discharged Under Pressure — no costly vacuum hose required. Ordinary 1" air hose carries dust up to 25 ft. away from drill.

Low-Cost Dust Collector — a simple filter and receptacle is all that's required. Even a canvas bag will do.

Quieter Operation — there is no unnecessary ear-splitting whine or howl in the dust collection system.

Highest Drilling Speed — because stronger suction and ample ports assure non-clogging operation.

Lower Bit-Shop Costs — tapered bit end and plain shanked drill steels eliminate need for furnaces, threading and forging equipment.

There's no other stopper like it!

For complete information, send today
for a copy of Bulletin No. 4195.



Ingersoll-Rand

5-707 11 Broadway, New York 4, N. Y.

COMPRESSORS • CARSET BITS • ALLOY RODS • HYDRA-BOOM JUMBOS
HOSE • JACKDRILLS • IMPACTTOOLS



DU PONT ANNOUNCES... Royalties slashed 50% on AKREMITÉ*

Now—save more money than ever before with this low-cost blasting agent

Designed and carefully compounded to give high energy, greater safety, easy loading, uniformly reliable results. Here's how to trim your overall costs to the bone.

Use the Akremite blasting method, designed for large-diameter holes in medium-hard material. You can make your own Akremite by a simple process (under sub-licensing arrangement with Du Pont or other licensed explosives manufacturers) or you can buy Akremite direct.

Either way, you save blasting dollars, because the proven reliability of Akremite makes it the most economical blasting agent you can use—and now the royalties have been cut in half. This also applies to the new improved formulation now available.

You can use Akremite for stripping, open-pit mining, or other large diameter shooting. Besides saving

money, it offers you several other advantages:

High Energy. Excellent blasting efficiency, as proven by the experience of large bituminous-coal strip pit operators and others under a wide variety of conditions.

Increased Safety. Can't be detonated by blasting caps, friction, shock or even standard "Primacord." Relatively insensitive Nitramite® primers or properly sized dynamite or non-nitroglycerin primers are necessary to do the job.

Fast, Easy Loading. Akremite is packaged in moisture-resistant plastic bags which are flexible and conform to the shape of the borehole to give maximum loading density and performance. They are easy to handle, and easy to load.

There's no Nitroglycerin in Akremite, either, so you have no "powder" headaches.

Write us for complete details, or contact any of the companies listed at lower left. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Del.

*Licensed exclusively to the Du Pont Company under the Maumee Collieries Co. Process Patent No. 2,703,528 and presently sublicensed to:

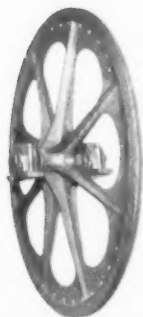
AMERICAN CYANAMID COMPANY
ATLAS POWDER COMPANY
AUSTIN POWDER COMPANY
ILLINOIS POWDER MANUFACTURING COMPANY
INDEPENDENT EXPLOSIVES COMPANY
INDEPENDENT EXPLOSIVES COMPANY OF PENN.
KING POWDER COMPANY
PACIFIC POWDER COMPANY
TROJAN POWDER COMPANY

**AKREMITÉ
BLASTING METHOD**
licensed to

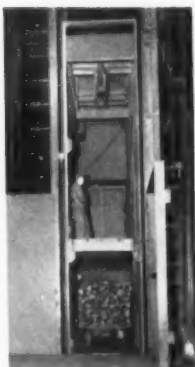


BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

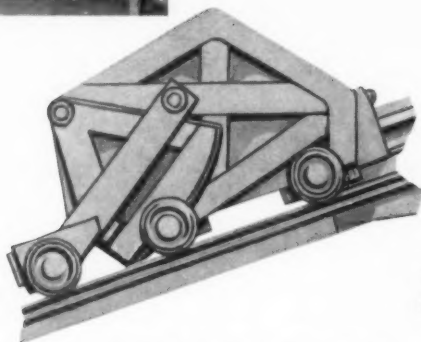
7 Ways To Cut Mining Costs



1 Lake Shore Idler, Carrying and Head Sheaves are available in many sizes and types. A new fabricated sheave represents the latest in design and construction.



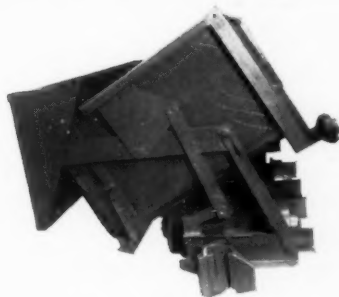
2 This double deck 80-man cage is one of many different types of vertical and inclined cages obtainable. Combination skip and cage also available for various requirements.



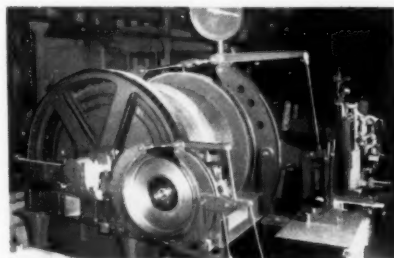
3 The JETINCLINE Bottom Dump Skip has all the advantages of Lake Shore's famous "Jeto" skip—fast, clean dumping and lasting construction. Available in capacities up to forty-five tons.



4 Car dumpers for various special operations are available. This rotary dumper is one unit. Also camelbacks and other dumpers.



5 Lohed tram car in dump position shows strong, lightweight construction. Dumps clean every time. A complete line of mine and man cars.



6 Many new and original features in hoist design and construction, incorporated in Lake Shore hoists, have set new standards of performance and safety in many mines. This is one of many offered by Lake Shore.



7 Vertical skips, inclined skips—all from Lake Shore. The patented "Jeto" bottom dump skip is shown here. Also Kimberly skips. For every shaft or headframe.

BRANCH OFFICES:

17 Battery Place, New York	37 California St., San Francisco
1025 London Road, Duluth	610 South 19th Avenue, Phoenix
211 Wazee Market, Denver	8 South Michigan, Chicago

LAKE SHORE, Inc.

Lake Shore Engineering Division
IRON MOUNTAIN 1, MICHIGAN

MERRICK SCALE MFG. COMPANY

180 Autumn Street, Passaic, New Jersey

Specialists in Automatic Weighing Equipment

The products of Merrick Scale Mfg. Company, although essentially weighing devices, are designed to function in a much broader capacity in many difficult controlling operations peculiar to the Process Industries.

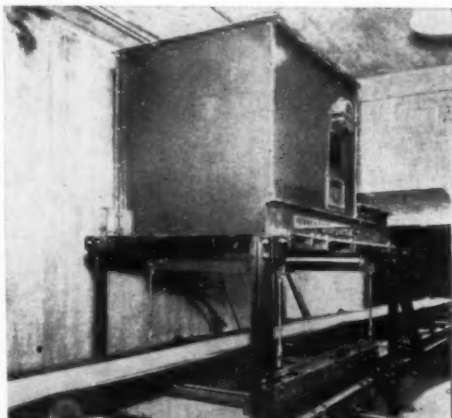
We have had over 40 years' experience in building equipment to solve such production problems as the weighing of materials in transit, automatic proportioning and batching of materials, weighing of liquids, and accurate totalizing and recording of continuously conveyed

material without interruption of process.

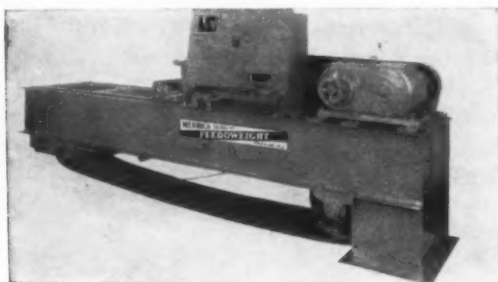
The Weightometer, Feedweight, and other Merrick weighing devices are carefully engineered for many other useful applications throughout the Industry than can be described on these pages. For complete data on these important items of production equipment, briefly outline your problem and mail it to the above address. Full information and covering literature will be sent to you without obligation.

The Merrick WEIGHTOMETER is a self contained integrating and totalizing conveyor scale for use with an existing belt conveyor of any width and capacity. It combines the principles of a platform scale and mechanical integrator. By utilizing a portion of the Conveyor Belt as the Weighing Platform and mechanically multiplying the weight on the belt by the belt speed through a mechanical integrator, a totalized weight is automatically obtainable in tons, pounds, barrels or other unit of measure per hour on a Master Totalizing Counter.

Any material that can be conveyor handled can be accurately weighed by a Weightometer. Such materials as coal, ore, sand, gravel, fish, fish products, minerals of all kinds, cement, fertilizer, filter cake, wood chips, sludge, etc., are common to the Weightometer. Weighing is accomplished without expense or interruption to conveyor flow. Neither are the services of a Weighman required. Easily installed, simple in operation, durable, automatic and accurate. All working parts are enclosed.

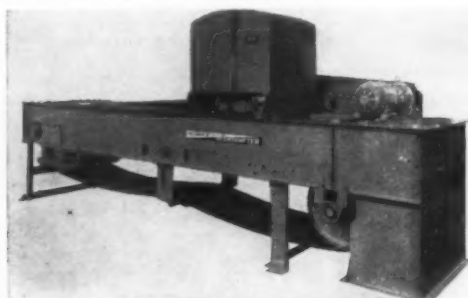


WEIGHTOMETER*



FEEDWEIGHT*

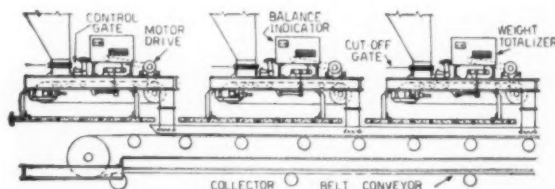
The WSS WEIGHTOMETER is offered for use where a conventional belt conveyor is not available for installation of a standard WEIGHTOMETER. The WSS is supplied complete with its own short belt conveyor, carefully and rigidly constructed to provide good weighing conditions; with motor drive and short supports for easy installation at customer's plant. Usually built with flat belt with moulded flanges along both edges with continuous skirts to prevent side spill of material off the belt during travel and weighing.



WSS WEIGHTOMETER

The FEEDWEIGHT is a dual-purpose machine which correctly and uniformly feeds material by weight and, in addition, automatically totalizes the weight of all materials so fed.

The FEEDWEIGHT delivers accurate amounts of material according to a predetermined setting, the control being accomplished by means of an automatic gate regulated by a special Powered Feed Regulator rather than by direct connection to scale beam. The scale beam is left free to respond instantaneously to any and all changes of load as it is completely independent of the proportioning mechanism.



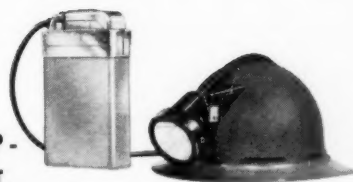
The drawing above illustrates an application of three FEEDWEIGHT units used in a battery arrangement for a proportioning operation. Each unit accurately weighs its own material, automatically controls the rate of feed, and continuously totalizes its weight. Should any hopper become empty, all units in the battery automatically shut down.

* Reg. U.S. Pat. Off.



...a complete product line
that brings greater safety,
increased production
to mining operations

EDISON R-4 ELECTRIC CAP LAMP - M.S.A. TYPE K HAT

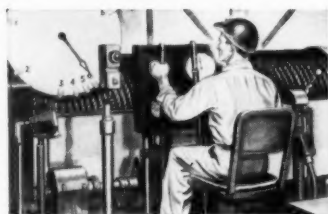


Today's modern mining methods call for more and better illumination. You'll find a dependable and profitable answer in the Edison R-4 Lamp. Its brilliant, unfailing beam permits miners to operate modern equipment at its greatest capacity, safely.

The famous Type K Skullgard is strong, light, durable, comfortable. Unaffected by oil, water, perspiration. Provides maximum head protection. Write for details.

M.S.A. HOISTPHONE

Dependable voice communication between hoisting engineer and moving cage, or at any level. Ideal for load leveling, shaft repairs, inspections. Also available—the M.S.A. MinePhone for instantaneous communication of orders to moving locomotives for improved haulage.



M.S.A. SELF-RESCUER

For immediate breathing protection in emergencies. Vital to the miner while traveling through carbon monoxide to fresh air. Available in cache assemblies for storage throughout the mine, or in individual carrying cases. U. S. Bureau of Mines Approved.



M.S.A. CHEMOX[®]

Provides complete breathing protection in any atmosphere for a minimum of 45 minutes. Chemox generates its own oxygen from replaceable chemical canister. Weighs only 13½ lbs. Comfortable in service. U. S. Bureau of Mines Approved.



M.S.A. McCA TWO-HOUR OXYGEN BREATHING APPARATUS

Assures complete breathing protection in unbreathable atmospheres for a minimum of two hours. U. S. Bureau of Mines Approved.



M.S.A. DUSTFOE RESPIRATOR

Light weight, compact, comfortable. A dust respirator that provides maximum protection. U. S. Bureau of Mines Approved.



M.S.A. "ALL-SERVICE" MASK

Dependable breathing protection against smoke and toxic gases including carbon monoxide singly or in combination, where there is no oxygen deficiency. Unit is U. S. Bureau of Mines Approved.



M.S.A. PNEOLATOR

Automatic artificial respiration device that assures maximum chances of recovery to those overcome by poisonous gases, electrical shock or other causes of asphyxia. Unit is protected by rugged carrying case.



M.S.A. MIDGET IMPINGER

A portable instrument for quick and dependable dust sampling. Entirely self-contained and hand operated. Ideal for dust control and survey work.

OTHER M.S.A. PRODUCTS FOR THE MINING INDUSTRY

Belts—Goggles—Safety Clothing—Carbon Monoxide Tester—Methane Detectors and Recorders—Stretcher Outfits—First Aid Kits and Materials. Send for our Mining Catalog for complete details on all products.



When you have a safety problem, M.S.A. is at your service. Our job is to help you.

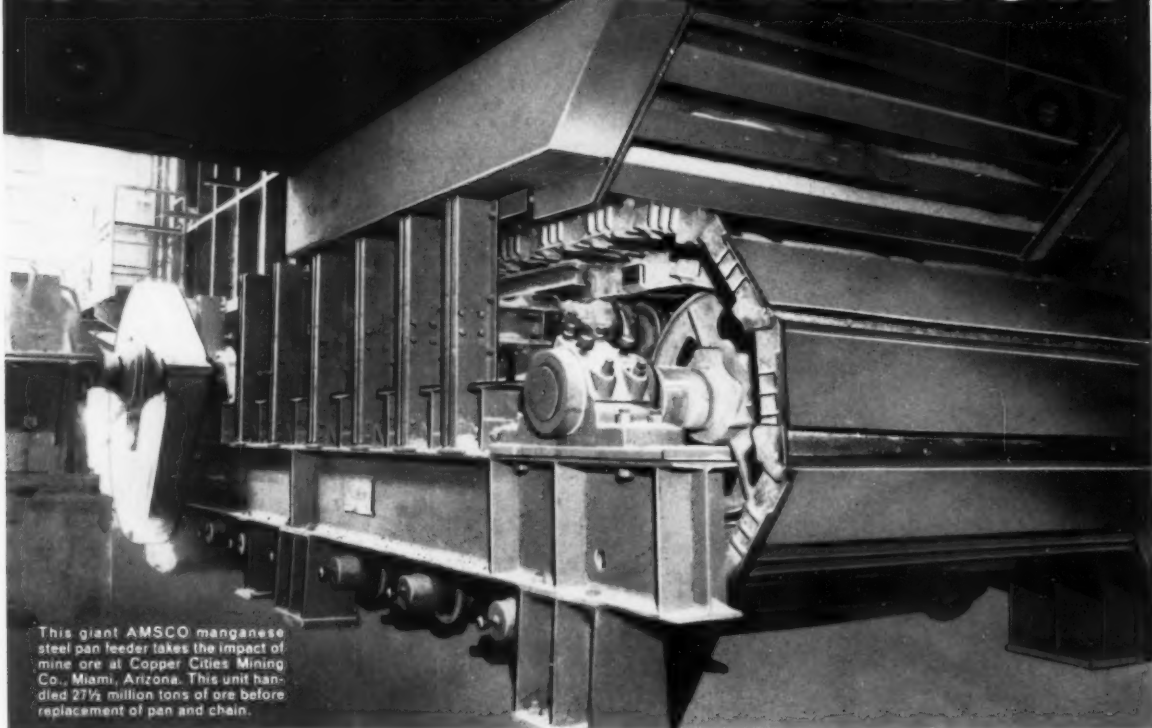
MINE SAFETY APPLIANCES COMPANY

201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 77 Branch Offices in the
United States and Mexico

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.

Toronto, Montreal, Calgary, Edmonton, Winnipeg,
Vancouver, Sydney, N. S.

STEPHENS-ADAMSON



This giant AMSCO manganese steel pan feeder takes the impact of mine ore at Copper Cities Mining Co., Miami, Arizona. This unit handled 27½ million tons of ore before replacement of pan and chain.

heavy duty ahead for your ore *Conveyor System*

How will you move a lot of ore under or over the ground, through processing, in and out of storage, to and from shipping—move it fast, at the least cost?

Mechanization is the way, the S-A way, and it's done by close prior study of your requirements by the best engineering brains in the bulk material conveying industry. These men are backed by a quality line of material handling and conveying equipment designed to move any type of ore in any quantity.

Long range planning of your ore handling needs is important. This calls for a conveyor system engineered for the years to come. You can find these kind of STEPHENS-ADAMSON systems everywhere in the world, moving all kinds of ore products at rock bottom cost.

Wherever you are, S-A engineers can design, build and install your conveyor system. They are available to work with your engineers or with your consultants.



A South American copper mine has been using an S-A system for 25 years. The original installation totals 18,485 feet and in terms of ore delivered is in the multi-million ton class. Six Amsco feeders are included in the system. S-A carriers, probably the largest ever built, weigh almost 1000 lbs. each.



Handling a wide variety of zinc ores, a complete S-A system conveys to storage by means of feeders, bucket elevator, shuttle conveyor, and centrifugal pilers. S-A speed reducers are used on all conveyor drives and spring type belt wipers keep belt surfaces clean. Close-up here shows centrifugal thrower.

S-A manufactures a wide range of material handling products in three complete plants in U. S. and Canada.

Belt Conveyors
Belt, Pan & Plate Feeders
Ship Loading Boom Conveyors
Stacking Conveyors
Storage & Reclaiming Systems
"Natural Frequency" Vibrating Conveyors
REDLER Conveyor-Elevators
ZIPPER Conveyor-Elevators
Conveyor Belt Cleaners

Headshaft Holdbacks
Grizzlies & Screens
Centrifugal Pilers
Bin Gates & Tunnel Gates
Car Pullers & Spotters
Bucket Elevators
Skip Hoists
SEALMASTER Ball Bearing Units



STEPHENS-ADAMSON MFG. CO.

MAIN OFFICE AND PLANT

130 RIDGEWAY AVENUE, AURORA, ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIF.

CLARKSDALE, MISS. • BELLEVILLE, ONTARIO

• Write for a bulletin on any of the above products.

SALES ENGINEERS ARE LOCATED IN ALL MAJOR CITY AREAS TO SERVE YOU!



New copper refinery at Reading, Pa. incorporates outstanding design innovations

Treadwell designed, manufactured and erected the complete casting and handling system for the new plant of Reading Metals Refining Corporation at Ontelaunee Township, Reading, Pa. The refinery will turn out billets to be drawn into tubes by the company's parent concern, Reading Tube Corporation.

The anode-casting wheel is furnished complete with automatic stop and manual start, ladle, ladle pouring mechanism, automatic knockout mechanism, all cooling and dressing equipment and mold-making mechanism. Also included are the anode take-off crane and bosh tanks.

The billet wheel features automatic stop and manual start operation and is pushbutton controlled. The pouring ladles are equipped with remotely controlled leveling devices. The wheel has automatic dump, cooling and conveying equipment.

Treadwell recommended and developed specifications for a Germanium rectifier for the tank house. The company also erected the waste-heat boilers, duct work, stacks, reverberatory-type furnaces, water-treating plant, air compressor, air piping and water piping, which includes the necessary piping from the river to the site.

Treadwell engineers will work with you to achieve a completely modern setup. For further details of Treadwell service and equipment, send for a copy of bulletin 70.

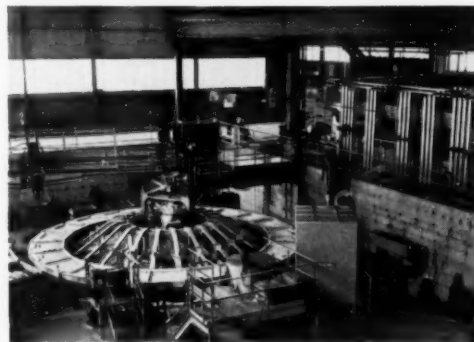
M. H. TREADWELL COMPANY, INC.

140 Cedar Street, New York 6, N. Y.

1015 Farmers Bank Bldg., Pittsburgh 22, Pa. • 1208 So. LaSalle St., Chicago 4, Ill.

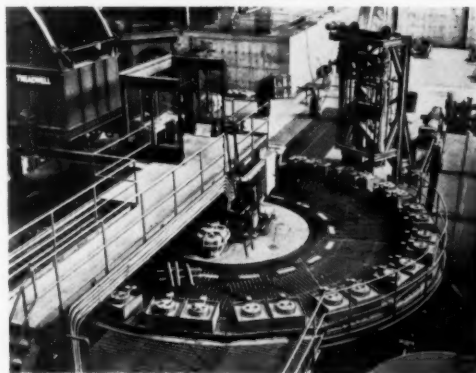
TREADWELL

Non-Ferrous
Smelting and Refining
Equipment



ABOVE: Anode-casting wheel

BELOW: Billet-casting wheel



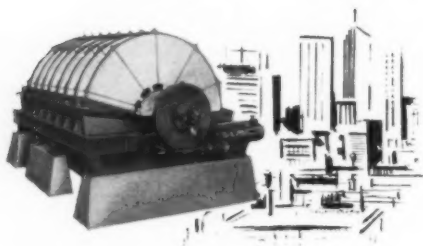
PERFORMANCE-PROVED IN 103 COUNTRIES



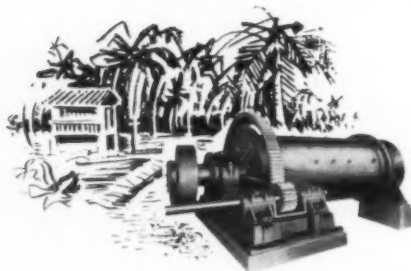
MORSE BROS. MACHINERY CO.
ESTABLISHED 1898



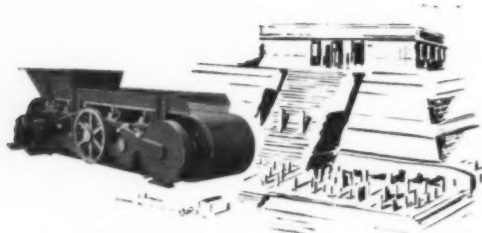
MORSE BALL MILLS point the way to new efficiency and economy of operation. Made in 30-inch, 3-foot and 4-foot diameters, their wave type head and shell liners are crafted of hard-iron, molychrome or manganese steel. The large diameter heavy construction trunnion bearings are self-aligning. The 3-foot and 4-foot mills have three-bearing countershafts with sole-plates for lateral adjustment of gears. Scoop or combination drum and scoop feeders available. Bulletin #D-575 tells all about our world-famous ball mills.



MORSE "CONTINUOUS" DISC FILTERS are part of the industrial heart of Pittsburgh. Preferred over other types because they require less floor space per ton of material treated, they can filter concentrates of different materials simultaneously. Sizes range from 4-foot, one disc filters, to 8-foot, eight disc filters, offering as little as 22, or as much as 800 square feet of filter area to handle a wide latitude of assignments. For particulars, write for Bulletin #D-5710.



MORSE ROD MILLS, wherever they're in use, offer low power costs per ton of ore ground, with maximum working efficiency. Manufactured in sizes of 3-foot and 4-foot diameters, up to 11 feet in length. They are the practical choice for grinding coarse feeds up to 65 mesh. Years of dependable service have proven their worth in service around the world. For full details, including capacity and grinding rod data, write for our Bulletin #D-575.



MORSE SILENT "VARI-STROKE" ORE FEEDERS combine flexible capacity with dependable performance, silent operation and simple regulation. They excel for feeding dry or wet crushed ore in uniform and pre-determined quantities from ore bins to grinding machinery. Belt speeds vary from 0 inch to 7 feet per minute with movement precisely controlled at all times. Request Bulletin #D-579.



MORSE "JETAIR" FLOTATION CELLS employ new and unique principles of aeration and agitation to make them universally acceptable for metallurgical efficiency and mechanical dependability. They're available in a wide range of sizes from 7 to 700 cubic feet per cell. Each individual cell has its own weir gate pulp level control. For detailed information, write for Bulletin #D-572.



ESTABLISHED 1898

MORSE BROS. MACHINERY CO.

A reliable source for all metallic and non-metallic ore dressing plants. Send us your flow sheet for prompt quotation.

2900 BRIGHTON BLVD., DENVER, COLO., U.S.A. CABLE "MORSE"

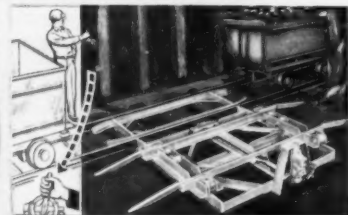
*Half
Century*

Rugged, Dependable A-M-D-C-O profit-paying Equipment



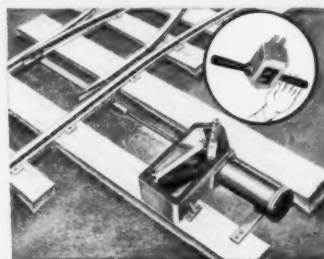
Canton Mine Door

The Automatic Door operates mechanically by weight of car on activating levers. Air power operation may be had where desirable. Operates at any trip speed. Two doors provide air lock.



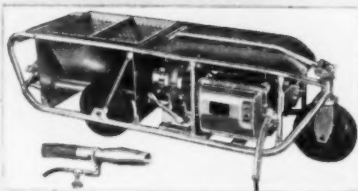
Canton Car Transfers

No alterations to track. Quickly installed and relocated—less rib to shoot than for jump switch—no hazards of cherry picker. Anti-friction bearings for easy hand operation. Manual or compressed air models available. (Air model illustrated.)



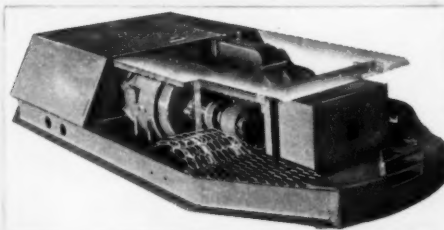
Track Switch Throwers

Electric or air operated. Route selections made by motorman at full trip speeds. Eliminates accident potential and extra man. Also ideal as Derailer.



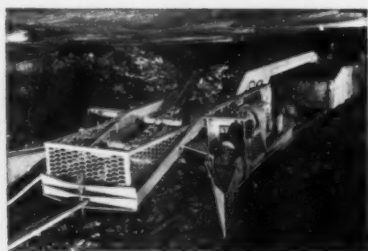
Wet or Dry Dusting

"Canton" Little Chief goes anywhere . . . rubber tire model 22½" high; skid model 18½" high for shuttle buggies, belts or mine cars; track-mounted for haulage roads. Delivers 34 to 60 lbs. dust per minute through 50 to 400 ft. 1½" hose.



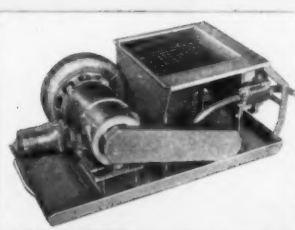
Dustmaster

The Track Mounted Hi-Pressure "Dustmaster" is the most powerful Duster ever built. Distributes dust to back areas 500 ft. from haulway.



Canton Track Cleaners

Hydraulic controls throughout clean entire track area mechanically in one pass—no costly hand labor; no dozers or loaders required. Now operating economically in coal, iron, copper, lead, potash, and salt mines.



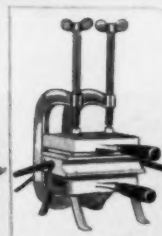
Mighty Midget

Weights only 280 lbs. Easily moved on shuttle car. Hand cart available. Ideal for small mines . . . inexpensive . . . capacity 7 tons per shift.



Canton Cable Splicer

"Canton" Cable Splicers reduce down time in splicing cable. Machine men should carry a pocketful. Just pound around cable and go on working. No special tools.



Canton Vulcanizer

Restores insulation to original condition. Used with Canton Splicers, strong as original cable.

Write for complete brochures.
Please use street and zone numbers.

The American Mine Door Company

2071 Duober Ave., Canton 6, Ohio





NC-1 MINE
CAR TRUCKS



NATIONAL
CUSHIONING UNITS

*every day, every year more and more
mine cars and locomotives are equipped
with*

NATIONAL DEVICES

No matter whether you're considering the purchase of new mine cars or locomotives . . . or whether you're thinking of upgrading existing equipment — *now* is the time to investigate the advantages of National devices.

For every day cost-conscious operators everywhere are switching over to National devices because they know they get more out of their equipment investment per workshift . . . per day . . . per year.

AA 6782

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY
Established 1868 Cleveland 8, Ohio

• WILLISON AUTOMATIC COUPLERS • RUBBER CUSHIONED UNITS • NACO STEEL LINKS
and SWIVEL HITCHINGS • MINE AND INDUSTRIAL CAR TRUCKS • NACO STEEL WHEELS

CANADIAN SUBSIDIARY: *National Malleable and Steel Castings Company*
of Canada, Ltd. • 128 Simcoe St. • Toronto 1, Ontario



NACO
STEEL WHEELS



WILLISON
AUTOMATIC COUPLERS

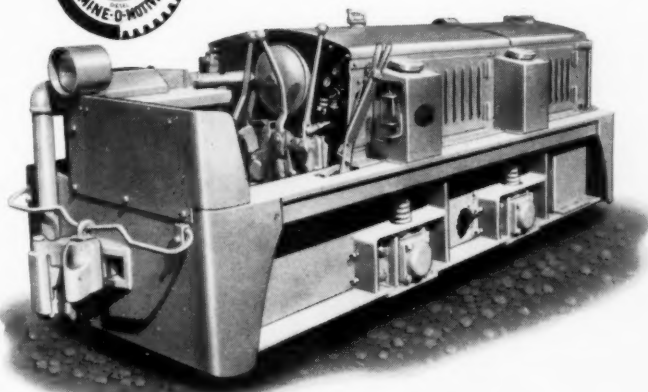
PLYMOUTH DIESEL MINE-O-MOTIVE

Mine Locomotives 3 to 12 Tons

Engineered expressly for
**YOUR LOCOMOTIVE
HAULAGE**
in Today's modern mining operations



You will find these rugged locomotives performing the toughest hauling jobs in mines and tunnels everywhere. Stamina, stability—ECONOMY in performance, SAFETY in operation—and extra years of trouble-free operation—are ENGINEERED in the design and construction of the Mine-O-Motive series. Controls are convenient, simple, safe. Visibility is excellent. And the Diesel-powered models shown have the famous Torqomotive* Drive for easy starting and smooth operation. They supplement Plymouth gasoline, Diesel and Diesel-electric models which have served all industry since 1914—and with lowest ton-mile costs in the field.

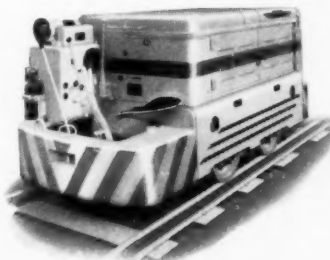


U. S. Bureau of Mines approved exhaust conditioning equipment.

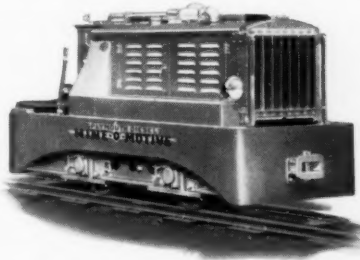


MINE-O-MOTIVE SERIES

Model FMD-00 5 or 6 Tons, Torqomotive* Drive—short wheel base, low center of gravity.

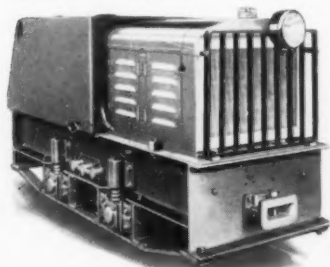


MINE-O-MOTIVE SERIES Model FMD-22 5, 6, 7, 8 or 10 Tons, Torqomotive* Drive (this model approved under Permissible Schedule #22, U. S. Bureau of Mines, for operation in gaseous mines).



MINE-O-MOTIVE SERIES

Model DMD-00, 8 to 12 Tons, with Torqomotive* Drive — low, compact, one-piece welded frame.



SERIES T, mechanical drive, 3, 3½ or 4 Tons. Torqomotive* Drive in 3½ or 4 Tons.

*TORQOMOTIVE DRIVE: Plymouth Transmission coupled to Hydraulic Torque-Converter.

FREE ANALYSIS Send us a brief outline of your hauling operations. An engineering analysis will reach you promptly with latest data on the type and size Mine-O-Motive for the best results in the work you want done.

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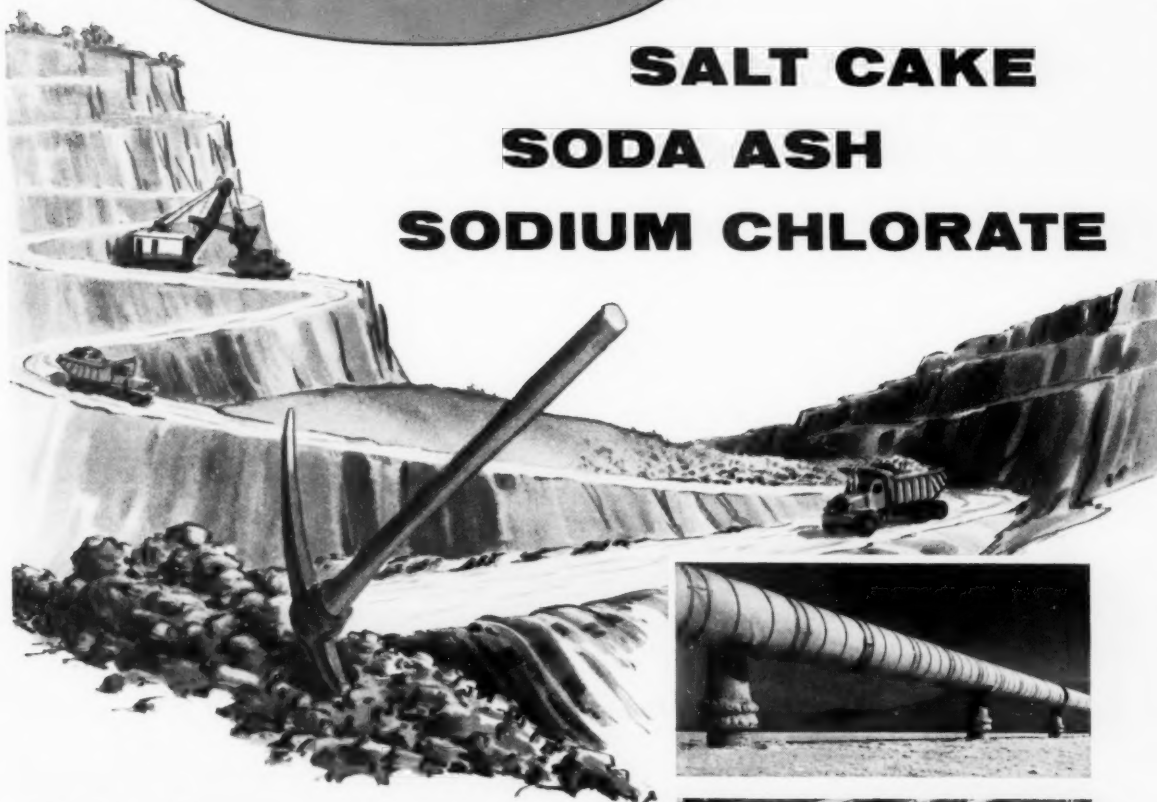
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TRONA

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pick of the mining world

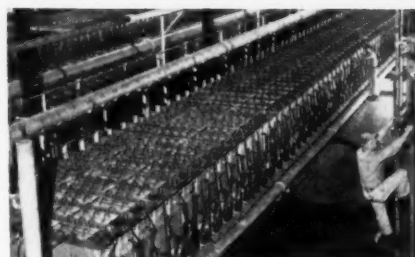
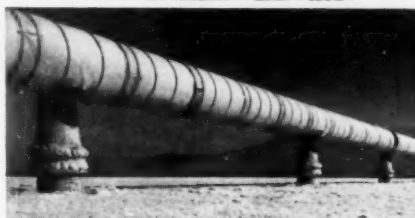
TRONA* Salt Cake, Soda Ash and Sodium Chlorate are improving ore processing everywhere—getting through to pay dirt faster, adding the mark of quality to ore concentrates. In the refining of lead dross and non-ferrous metals, TRONA Salt Cake and Soda Ash provide more effective and thorough ore treatment. In uranium and similar ore processing, TRONA Sodium Chlorate speeds oxidation, upgrades refining action. For your refining process TRONA Chemicals assure a hard working, uniform crystal that improves quality and increases mineral recovery. Make TRONA your choice for faster, more profitable processing. Ample supply and quick delivery are possible—anywhere.

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At Trona, California (top view) high purity Soda Ash and Salt Cake are recovered from the chemical-rich brines of Searles Lake. The Henderson, Nevada, plant (bottom view) produces highest grade Sodium Chlorate by electrolytic processes.



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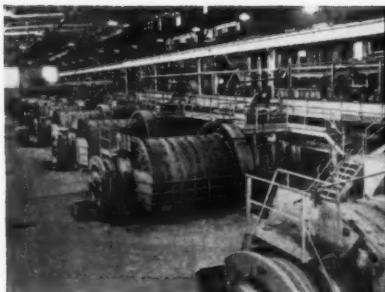


DART 135-UG underground shuttle truck with dual controls and through conveyor.

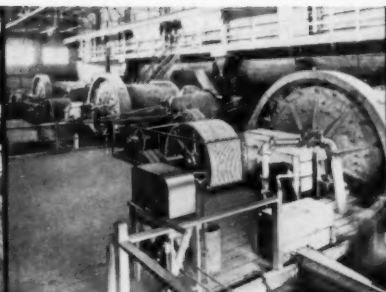


DART's 50 Tonner powered by a 400 or 600 HP Diesel Engine for that big payload.

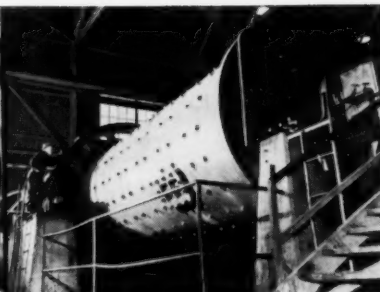
Bulletin! March 14th Dart Merged With Kenworth Motor Truck Division of Pacific Car & Foundry Company. New Name—KW-Dart Truck Company



This large copper company has 17, 9'x 12' and three 10'x 14' Marcy Open End Rod Mills; three 8'x 12' and three 10'x 12' Marcy Grate Discharge Ball Mills.



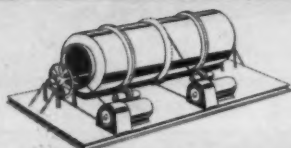
Three 8'x 9' Marcy Grate Discharge Ball Mills in a large copper mill.



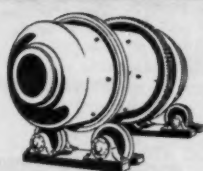
This 8'x 20' Marcy Pebble Mill is one of 21 Marcy Mills used by a molybdenum company.

- grate discharge ball mills, open end rod mills, tube mills, pebble mills, center and end peripheral discharge rod mills, acid-proof mills, batch mills.
- for metallic and non-metallic ores, cement, specification sands, clay, fibrous material.
- wet or dry grinding.
- 29 different diameter sizes, from 12" to 12' 6" inside diameter, are operating and proved in the field.
- grind material 1 1/2" or finer to a product as fine as 325 mesh.
- capacities up to 6650 tons per 24 hours.

Other Products

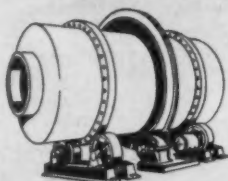
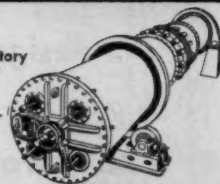


Custom Engineered Pug Mills.



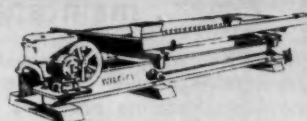
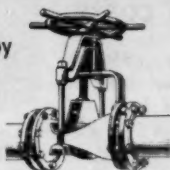
Custom Engineered Leaching Drums.

Burt Filters.
30"x 72" Laboratory Unit, and 5'x 40' Standard Commercial Size.

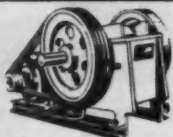


Custom Engineered Fusion Furnace.

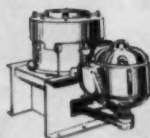
Massco-Grigsby Pinch Valves.
1" to 14" dia.



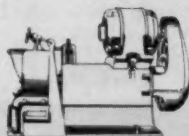
Wilfley Concentrating Tables.
Laboratory and Commercial Sizes.



4"x 6" Massco Laboratory Jaw Crusher.



6" and 10" Massco Gy-Roll Reduction Crusher.



Massco-McCool Pulverizer.

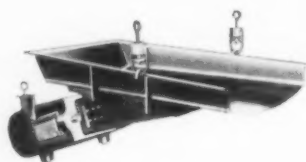


Marcy Direct Reading Pulp Density Scale.

THE MINE AND SMELTER SUPPLY CO.

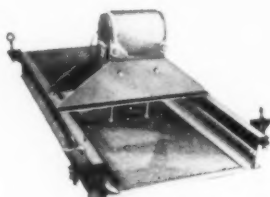
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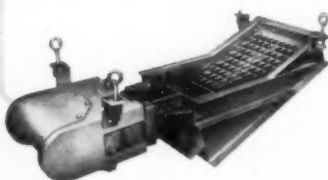
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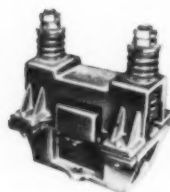
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For sizing, dewatering, dedusting, etc. Feed and screen in one operation. Screen up to 3" material size.



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Assure positive flow of stubborn materials from bins, hoppers and chutes.



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Complete units for changing a-c to d-c. Available in sizes up to 500 KW.



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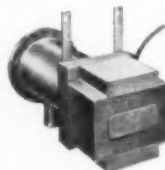
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Powerful, completely self-contained units — automatic bit rotation — Drills and blow holes clean to a depth of 20 feet.



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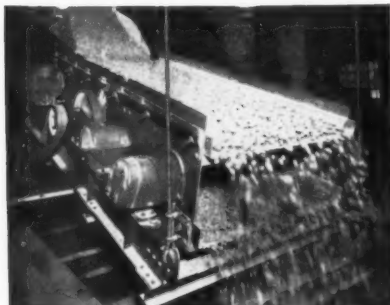
Atlanta 3, Ga.
Hurt Building

Dallas 1, Texas
Republic National Bank Bldg.

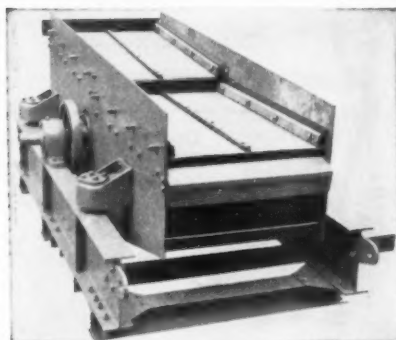
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Ty-Rock Screen (Discharge chutes removed to show material)



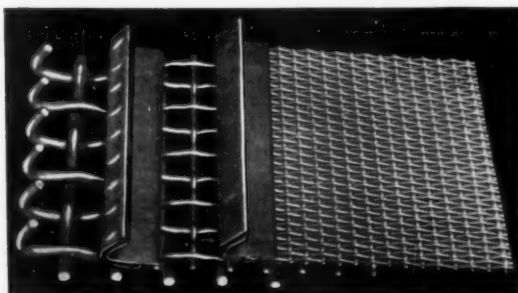
Tyler-Niagara Screen



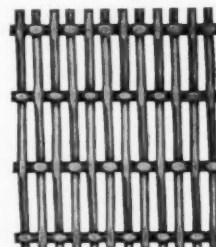
Hum-mer Screen



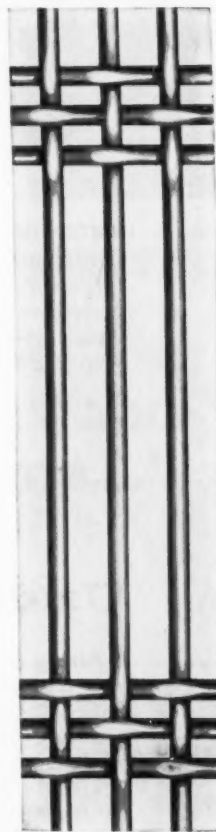
Tyler Standard Screen Scale Testing Sieve



Tyler Hook-strip and bent edge for screen sections



Ton-Cap Screen Cloth



Ty-Rod Screen Cloth



Ro-Tap Testing Sieve Shaker with Tyler Sieves

WOVEN WIRE SCREENS

Supplied in all meshes and metals and for all purposes. Tyler Woven Wire Screen is noted for its accuracy and dependability. More than 7,000 specifications are manufactured, many of which are kept in stock ready for immediate shipment.

Write for Catalog 74, Specification Tables of Tyler Woven Wire Screens.

TY-ROCK SCREENS

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TYLER-NIAGARA SCREENS

High-speed circle-throw screens for economical screening of coal products. Send for Catalogue 64.

TY-ELECTRIC HEATED SCREENS

The Ty-Electric System of electric heating of Ty-Rock & Hum-mer Screens represents the most recent development in screening damp materials. The woven-wire screens are heated by passing electric current through the wires. Heat keeps the surface of the wire dry so that fine damp particles will not stick on the wires and blind the openings. Send us details of your damp screening problems so we can make recommendations.

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The Hum-mer was the first electrically vibrated screen and is still, by far, the lowest in operating cost for accurate sizing of medium and fine material. The Hum-mer employs less than one H.P. per vibrator and is furnished in one, two or three deck units in both open and closed models. Send for Catalogue 63.

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Tyler Standard Screen Scale Testing Sieves are the accepted standard for sieve testing throughout the world. The Ro-Tap Testing Sieve Shaker and the Ty-Lab Tester assure comparable, accurate data. Send for Catalogue 53.

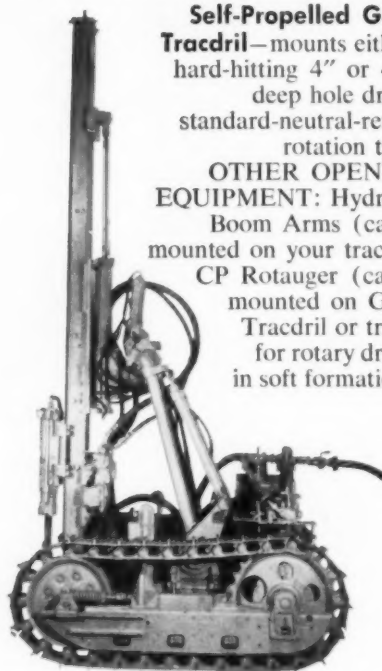
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Tracdril—mounts either a hard-hitting 4" or 4½" deep hole drill in standard-neutral-reverse rotation types.

OTHER OPEN PIT EQUIPMENT: Hydraulic Boom Arms (can be mounted on your tractor); CP Rotauger (can be mounted on G-800 Tracdril or tractor for rotary drilling in soft formations).

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5 Airleg Models available in *Attachable* types for conversion of standard sinkers to airleg operation and in *Integral* types for production drilling. In feed lengths up to 6 feet. **OTHER UNDERGROUND EQUIPMENT:** CP Rotaugers; Stoppers; Drifters, Hand Held Sinkers, Shaft Sinking Jumbos.

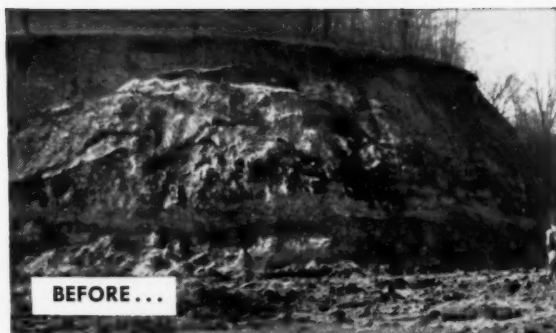


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6¢ lb.

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BIGGER BLASTS AT LOWER COST—that's the story reported by strip miners and quarry owners who have tried the new blasting method with Spencer Prilled Ammonium Nitrate. Savings up to 50% are common.

BETTER FRAGMENTATION — BIGGER PROFITS! Actual field tests show that the new blasting method developed with Spencer Prilled Ammonium Nitrate commonly produces about 25% better fragmentation.

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A new, low-cost blasting method, developed by Maumee Collieries, using Spencer Prilled Ammonium Nitrate, was first announced to the public about two years ago. At this time Spencer reported that this new method cut blasting costs about 50% and moved about 25% more material. Since this time Spencer has pioneered this new, low-cost blasting method all over the world.

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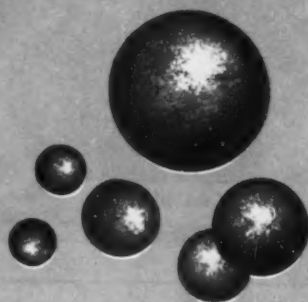


quality steel

MINING PRODUCTS

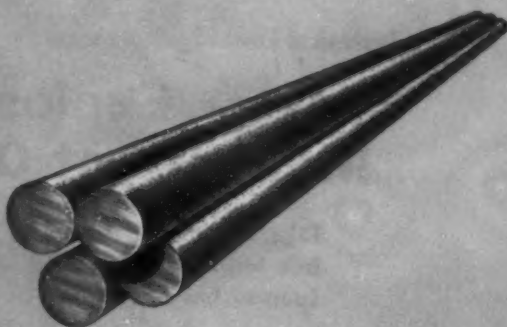
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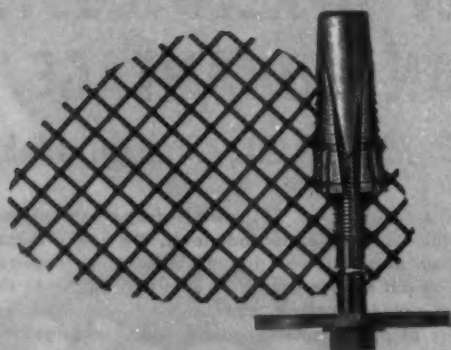
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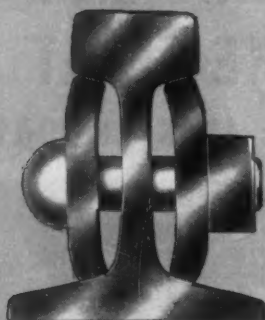
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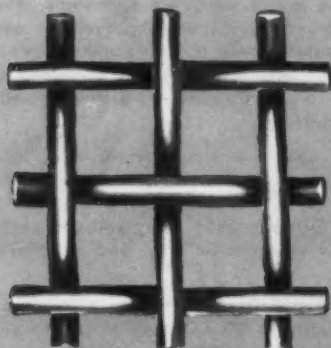
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Rock Bolts available in slot and wedge design, or expansion type with the Pattin Shell, designed for easy installation. Reduces need for timbering, while providing safe, economical support for underground mine openings. Realock Metallic Fabric gives important extra support between bolts.



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Available in a wide variety of meshes, metals and weaves to satisfy every screening need. Made from the toughest steels and alloys for processing, cleaning, grading, filtering or screening applications, where resistance to corrosion, vibration, abrasion, fatigue or heat is needed.



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3803

"FLEXIBILITY AND LOW UPKEEP COSTS MAKE FLYGT PUMPS AN ADVANTAGE,"

reports LUCKY FRIDAY SILVER-LEAD MINES CO., Mullan, Idaho



While working a 750' shaft-deepening project from the 2300 to 3050 foot level, the Lucky Friday Mine ran into a dewatering problem which required pumping out an average of 150 to 175 GPM. At the start of sinking operations, air pumps were used, but because of periodic extra volume water seepage and excessive repair and maintenance costs, the air pumps were abandoned in favor of Flygt Model B-80L Submersible Electric Pumps.

In the pumping cycle, a Flygt Pump was lowered to the shaft bottom as soon after each blast as possible, and the water was lifted to relay pumps at a higher level, with heads up to 80 feet. The Mine Engineer, in a paper on the operation delivered before the Northwest Mining Convention, said of the Flygt pumping method: "Although the initial cost seemed high at first, the absence of expensive upkeep and the efficient pumping performance justified the investment. The quiet operation of the Flygt was a decided relief after listening to the siren-like air pumps. The Flygt Electric Pump was a distinct improvement over any type of air pump where large volumes of water had to be moved from the shaft bottom. It was low in upkeep cost and its unusual flexibility made it a definite advantage."

Since shaft sinking was completed, two Flygt Model B-80L Pumps now have become a part of the Lucky Friday's permanent mine pumping installation. In service since October 1956, they still are performing with a maximum of efficiency and a minimum of upkeep.

Flygt centrifugal Pumps range in size from 1 1/2"-85 GPM capacity to 8"-3,000 GPM capacity. Head capacities range up to 210 feet. Weights range from 80 to 1,200 pounds.

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| ✓ Electric | ✓ Heavy Duty |
| ✓ Resistant to Salt Water | ✓ Continuous Duty |
| ✓ Submersible | ✓ Runs Dry Without Damage |
| ✓ Easy to Handle | ✓ Quick and Easy to Service |
| ✓ Low Maintenance Costs | ✓ No Installation Costs |
| ✓ Will Pump High Amount of Solids | ✓ No Priming Needed |



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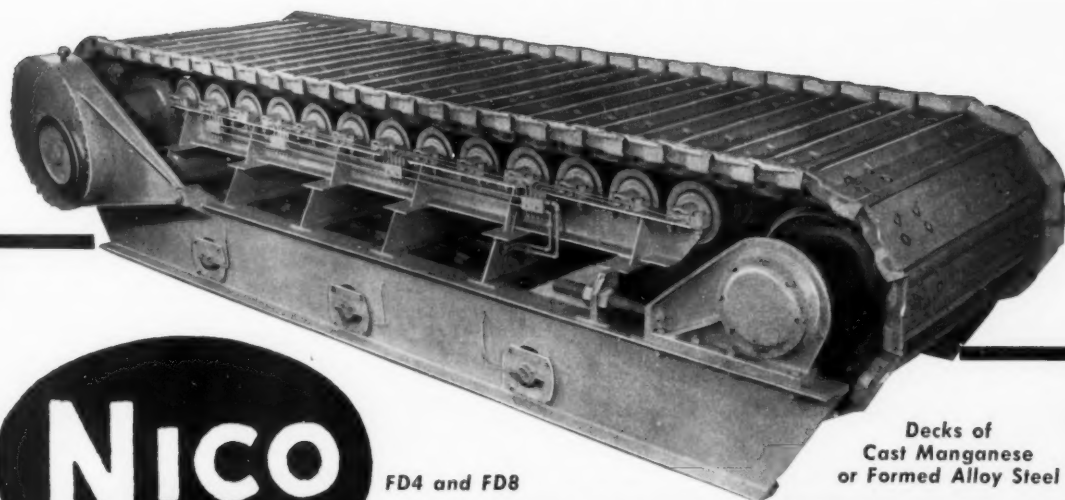
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Parts interchangeable with world's most used tractors

Saves carrying extra spares . . . parts obtainable anywhere at low cost. Chain pitch is only 6¾ inches in FD4 Model, and 8" in FD8 Model, very short for such heavy duty feeders . . . insures more even feed.

Shaft mounted NICO Speed Reducer eliminates open gearing, counter shaft, lubrication problems.

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- Use only a few trucks in the pit.
- Track laid directly on pit wall at angles up to 45°.
- Simple extension of track follows deepening of pit.
- Load directly from trucks in pit. (See inset photo)
- Use multiple loading stations along trackway if desired.

Skips of from 5 - 35 ton capacities available. Write for information.

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DULUTH 7, MINNESOTA



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for Outstanding Advances

Plus A Complete Line of Performance-

Simplex-Tirex Twin Shuttle Car Cables



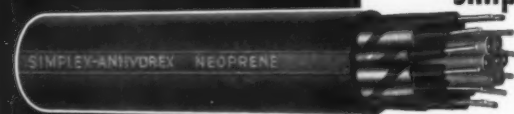
Feature *Gear-Shaped* insulated conductors that firmly interlock with the jacket so that even continual twisting of the cable will seldom pull them out of position. They will not twist or override each other. The Selenium-Neoprene Armor is CURED-IN-LEAD for extra toughness. Marked P-101 BM. Available as Type W and Type G.

Simplex-Anhydrex XX Cables



High-voltage cables that assure uninterrupted service at 2,000-35,000 volts operation in underground, duct or aerial installations. Insulated with Anhydrex XX, first high-voltage insulation combining all the properties necessary for trouble-free operation when exposed to water and moisture, heat, ozone and other deteriorating agents. Jacketed with a special neoprene compound that provides steadfast protection against rough handling, soil acids and alkalis, oils, grease, chemicals and flame.

Simplex-Anhydrex Signal & Communication Cables



Light-weight, easily installed cables for telephone, signal and communication circuits. Protected by a special neoprene jacket. No metallic tapes necessary. Insulation has ideal electrical and physical characteristics for these uses.

► Available as two-conductor or multi-conductor cables for telephone and communication service. These cables can also be used for block signaling as well as operating electric switch-throwing devices.

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Proved Cables for Every Mine Use!

SERVICE	USE	SIMPLEX PRODUCT
MINING	Electric Drills	TIREX SO Cord, TIREX Heavy Duty Mine Cord.
	Shot Firing	TIREX Shot Fire Cord (Round), Simplex Shot Fire Cord (Twin).
MINE EQUIPMENT	Shuttle Cars	TIREX Special Shuttle Car Cable (see opposite page).
	Shuttle Cars, Cutters, Loaders, Continuous Miners }	TIREX Twin Mining Cable; Type W, without ground wires; Type G, with ground wires. Also TIREX 3-Conductor Round Cable, Type W.
	Locomotives	TIREX Locomotive Cable; steel reinforcing strands in conductor.
	Stripping Shovels and Draglines	TIREX High-Voltage Cables; Types W, G, SH-A, SH-B, SH-C, SH-D.
		All TIREX Cords and Cables are jacketed with CURED-IN-LEAD Selenium-Neoprene Armor. All stock sizes for mine use are marked P-101 BM.
MINE EQUIPMENT	Air Compressors (Portable)	TIREX Twin Cables, Types W and G. TIREX 3-Cond. Round Cable, Type W.
	Air Compressors (Stationary) }	Anhydrex or Anhydrexne Cables. Both feature the exceptional moisture resistance of Anhydrex insulation and the durability of a neoprene jacket. Anhydrex cables can be installed directly in earth, in conduit and in air. Anhydrexne cables, with lighter jacket, should not be buried directly in earth.
	Ventilating Fans }	Anhydrex Multi-Cond. Signal Cable. Polyethylene-Plastex Signal Cable.
	Mine Pumps }	Anhydrex Mine Telephone Cable.
	Car Pullers }	
PROCESSING EQUIPMENT	Track Signal Systems	
	Telephone Systems	
PROCESSING EQUIPMENT	Crushers	Anhydrex Cables. Anhydrexne Cables.
	Vibrator Screens	TIREX SO Cords. Anhydrex Cables.
	Flotation Cells	Anhydrex Cables. Anhydrexne Cables.
SHOPS	Machine Tools	TIREX SO and SJO (light service) Cords. Plastex Machine Tool Wire; available with light, heavy and extra-heavy insulation.
	Welding Machines	TIREX Super-Flexible Welding Cable.
	Electrode Cable	TIREX Single-Conductor Cable.
	Electrode Return	
	Welding Machines	TIREX 2 and 3-Conductor Cables.
	Power Side	TIREX Motor Lead Cable.
	Locomotive Wiring	TIREX Twin and TIREX Round Type W Cables.
POWER AND LIGHTING	Battery Charging	
	Aerial Distribution Systems	Anhydrex, Varnished Cambric and Paper Insulated Cables — available with built-in messenger or messenger can be applied in field by spinner.
	Underground Distribution Systems	Anhydrex Cables; provide resistance to water and moisture, soil acids and alkalis; have no metallic sheaths to crystallize and corrode.
	Borehole and Shafts	Anhydrex Cables and Varnished Cambric Cables — available with a wide choice of outer coverings to meet the requirements of all methods of suspension.
	Sub-Surface Distribution	Anhydrex Feeder Cables, Varnished Cambric Feeder Cables.
	Switchboard Wiring	Anhydrexne Wires, Plastex Wires.
POWER AND LIGHTING	Yard Floodlighting	Anhydrex Cables.

Write for Catalog 1008 — "Simplex Cables for Mining"

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Vulcan-Denver



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Famous for low maintenance and long life. These rugged little slushers are available in 10 to 75 HP sizes. Ball and Roller Bearing construction, sealed planetary gearing, heat-dissipating clutches. Built to any required production in single, double or triple drum models.

LARGE SLUSHERS



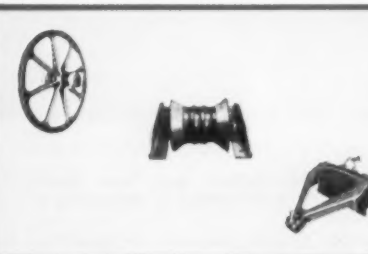
These 100 to 150 HP high capacity slushers are available in single or double drum models. Long used and continually reordered for large tonnage block caving operations. Wide choice in controls and features.

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Automatic bottom dumping skips are the coming thing. Vulcan vertical, self dumping skips or skip-cage combinations built to your requirements offer maximum strength and safety, high capacity-to-weight ratios. Vulcan cages are safe and easy running, available in various styles.

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Try this slope roller with replaceable rubber segments for heavy service. Cushions rope for longer life. Segment rings also in Neoprene. Alemite lubricated sealed ball bearings.

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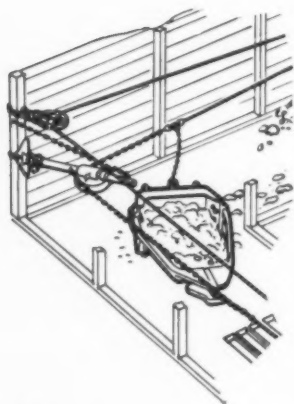
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U.S.A. Pat. No. 2716824. Canada Patent 1957
Other Foreign Patents Applied For

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Half Side Plate and Full Side Plate Models in 8", 10" and 12" sizes with choice of hook, shackle or safety swivel shackle suspension. Manganese steel sheaves and side frames, tapered roller bearings, wide throats. Send for Bulletin No. 271.

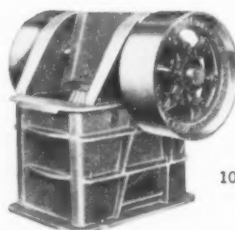
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Famous for big load capacity, low horsepower requirements and general "Dig-ability." Used in practically every mining area throughout the world. Send for Bulletin 287 which describes the complete line of Pacific "Slushmaster" Scrapers.

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2A	26"	465#
2A	30"	510#
2A	34"	550#
AB	36"	775#
AB	42"	850#
AB	48"	960#
AB	54"	1080#
3B	36"	1400#
3B	42"	1540#
3B	48"	1730#
3C	60"	2580#
3D	48"	2030#
3D	60"	2865#
3D	72"	3700#
3D	84"	4500#

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See Bulletin
No. 256

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1958 MINING WORLD-WORLD MINING Catalog Index of Equipment and Manufacturers

The CATALOG INDEX is comprised of two sections:

SECTION I is an alphabetical listing of the specialized products and equipment used by the MINE-MILL-SMELTER industry. All principal manufacturers of these products and equipment are listed for your convenience.

SECTION II is an alphabetical list of all principal manufacturers **AND THEIR ADDRESSES.**

The names of manufacturers who are represented in

this issue by catalogs or advertisements are printed in **BOLDFACE** type in Sections I and II. The page numbers of their catalogs or advertisements are also given in Section II.

Every effort has been made to make your MINING WORLD-WORLD MINING CATALOG ISSUE, Development and Directory Number as complete and accurate as possible. MINING WORLD, however, cannot be responsible for changes in names, addresses, and other discrepancies.

SECTION I Equipment Index

SECTION I contains an alphabetical list of product and equipment names. Wherever feasible, equipment has been indexed under headings representing the nomenclature preferred by the industry; or in many cases under the principal proper noun. For example,

"Flotation Machines" are indexed as such rather than under the all-encompassing heading "Machines." Rock Drills, however, have been most logically listed as "Drills, Rock."

ACETYLENE

See Welding Equipment,
Supplies, and Services

ACID

See Reagents and Chemicals

ACTUATORS

See Cylinders and Actuators

AERIAL SURVEYING

See Exploration Services

AGGLOMERATING

EQUIP. AND SUPPLIES

See Pelletizing and Nodulizing
Equipmt.

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Santa Fe Tank Div., Fluor Products
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WEMCO—SEE WESTERN MA-
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Western Gear Works, Pacific Gear
Plant
WESTERN MACHINERY CO.
Westinghouse Air Brake Co., Le
Roï Div.

AIRCRAFT

SEE EXPLORATION SERVICES

AIR DRIVEN TOOLS

See Tools, Air Driven

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Titan—see Mill & Mine supply, Inc.

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Westinghouse Air Brake Co., Le
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ASSAY SUPPLIES

See Laboratory Equipment
and Supplies

ASSAYERS

See Laboratories & Assayers

AUGERS

See Drills; Bits

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BALL MILLS

See Grinding Equipment

BALLS

See Grinding Equipment

BATTERIES

See also Safety Equipment

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BATTERY CHARGERS

See Chargers, Battery

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See Communications

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See also Conveyor Equipment;
Fasteners, Belts, Safety Equip-
ment

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ACCESSORIES

See also Feeders

BINS AND CHUTES

ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
BARBER-GREENE CO.
BETHLEHEM STEEL CO.
Bodinson Mfg. Co.
Chain Belt Co.
COLUMBIAN STEEL TANK CO.
Com-Hyo Feeder—see Pulva Corp.
Conveyor Co., The
Diamond Iron Works Div., Goodman
Mfg. Co.
Equipment Engineering Co.
General American Transportation
Corp.
General Electric Co., Ltd., The
Hack Engineering Works
HEAD WRIGHTSON, STOCKTON
FORGE LTD.
HEWITT-ROBINS INC.
Hirsch Bros. Machinery Co.
Hockensmith Corp., The
Humboldt, Klockner-Humboldt-
Deuts., A. G.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deuts. A. G.
Koehring Co., Johnson Co., C. S. a
subsidi.
LINK-BELT CO.
Lippmann Engineering Works
MAYO TUNNEL & MINE EQUIP.
McNally Pittsburgh Mfg. Co.
MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor &
Co., Inc.
Pioneer Engineering Works, Inc.
Pollock Co., The Wm. B.
Richardson Scale Co.
Roberts & Schaefer Co.

Rogers Iron Works
Sanford-Day Iron Works, Inc.
Santa Fe Tank Div., Fluor Prods.
Co.

Saracco Tank & Welding Co.
Smith Engineering Works
STEARNS-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
Straub Mfg. Co.
STURTEVANT MILL CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
United States Steel Co., Amer.
Bridge Div.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Wamco—see Washington Machin-
ery Co.
Washington Machinery Co.
Watt Car & Wheel Co., The
Yuba Mfg. Co.

GATES, LIPS, ETC.

ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Bodinson Mfg. Co.
Conveyor Co., The
General Elec. Co. of England, Ltd.
Hack Engineering Co.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-
Deuts., A. G.
Klockner-Humboldt-Deuts., A. G.
Koehring Co., Johnson Co., C. S. a
subsidi.
LINK-BELT CO.
Lippmann Engineering Works
McNally Pittsburgh Mfg. Co.
MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Ogden Iron Works Co.
Pioneer Engineering Div., Poor &
Co., Inc.
Roberts & Schaefer Co.
Sanford-Day Iron Works, Inc.
Saracco Tank & Welding Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
Universal Dredge Mfg. Co.
Wamco—see Washington Machinery
Co.
Washington Machinery Co.

INDICATORS

Bin-Dicator Co., The
Convaire, Inc.
Conveyor Co., The
DENVER EQUIPMENT CO.
General Electrical Co. of England,
Ltd.
HEWITT-ROBINS, INC.
Hirsch Bros. Machy. Co.
Jeffrey Mfg. Co., The
Koehring Co., Johnson Co., C. S. a
subsidi.
McNally Pittsburgh Mfg. Co.
ROBIN TRONIC—SEE HEWITT-
ROBINS, INC.
Saracco Tank & Welding Co.
STEPHENS-ADAMSON MFG. CO.
TELLEVE—SEE STEPHENS-
ADAMSON MFG. CO.
TELLURIDE IRON WKS.

VIBRATORS

BARBER-GREENE CO.
Bodinson Mfg. Co.
Carrier Conveyor Corp.
Cleveland Vibrator Co., The
Consolidated Pneumatic Tool Co.,
Ltd.
Conveyor Co., The
DENVER EQUIPMENT CO.
Eries Mfg. Co.
General Electric Co. Ltd., The
HEWITT-ROBINS, INC.
KENNEDY-VAN SAUN MFG. CO.
Lippmann Engineering Works
Rotary Silent—see Martin Engi-
neering Co.
Saracco—see Saracco Tank & Weld-
ing Co.
Saracco Tank & Welding Co.
Sherwen—see General Elec. Co. of
England, Ltd.
STEPHENS-ADAMSON MFG. CO.
SYNTRON CO.
TY-SPEED—SEE TYLER CO.,
THE W. S.
TYLER CO., THE W. S.
Universal Engineering Corp.

**Manufacturer's Complete Names and Ad-
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of this yellow section. Firms appearing in
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BITS

See also Steel

AUGER BITS

ACKER DRILL CO., INC.
AMERICAN BRAKE SHOE CO.
Bowdill Co., The
Cardox Corp.
Central Mine Equipment Co.
Coal Master—see Central Mine Equipment Co.
Coeur d'Alene Hardware & Foundry Co.
Failing Co., Geo. C.
Firth Sterling Inc.
Firthite—see Firth Sterling Inc.
GARDNER-DENVER CO.
General Electric Co., Carbology Dept.
KENNAMETAL INC.
Kerfmaster—see Central Mine Equipment Co.
Mobile Drilling Inc.
Pennsylvania Drilling Co.
Salem Tool Co.
Thor Power Tool Co.
Vascoloy-Ramet Corp.

CHURN BITS

BUCYRUS-ERIE CO.
General Electric Co., Carbology Dept.
Mill Iron Works, Inc.
Mobile Drilling, Inc.
SPANG & CO.
Westinghouse Air Brake Co., Le Roi Div.

DIAMOND BITS

ACKER DRILL CO., INC.
American Coldset Corp.
Ascolite—see Smit & Co., Inc.
BOYLES BROS. DRILLING CO.
BOYLES BROS. DRILLING CO., LTD., (CANADA)
Bronzolite—see Smit & Co., Inc.
Anton
Champion Diamond Co.
CHRISTENSEN DIAMOND PRODUCTS CO.
Damco—see Drilling Accessory & Mfg. Co., Inc.
DIAMOND TOOL RESEARCH CO., INC.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo. C.
General Electric Co., Carbology Dept.
Hard Hed—see Smit & Sons, Inc., J. K.
Havlick, J. L.
Hitchcock Mfg. Co., Leo
Hoffman Bros. Drilling Co.
Impregnalite—see Smit & Co., Inc., Anton
JOY MANUFACTURING CO.
Koebel Diamond Tool Co.
Koebelite—see Koebel Diamond Tool Co.
LONGYEAR CO., E. J.
McClintock Co., R. S.
Metal Carbides Corp.
Mobile Drilling Inc.
Mott Core Drilling Co.
Nicolite—see Smit & Co., Inc., Anton
Pennsylvania Drilling Co.
PERMASET—SEE BOYLES BROS. DRILLING CO., LTD.
Porto Tool Co.
ROSSET—SEE SPRAGUE & HENWOOD, INC.
Shark Tooth—see American Coldset Corp.
SMIT & CO., INC., ANTON
Smit & Sons, Inc., J. K.
SPRAGUE & HENWOOD, INC.
Svenska Diamantbergborrnings AB.
TELLURIDE IRON WORKS CO.
THOR POWER TOOL CO.
TUFSET—SEE SPRAGUE & HENWOOD, INC.
TRUCAST—SEE SPRAGUE & HENWOOD, INC.
Truco—see Wheel Truening Tool Co.
VAREL DIAMOND PRODUCTS CO.
VAREL MANUFACTURING CO.
Wheel Truening Tool Co.
Winter, Ernst & Son

PERCUSSION BITS

ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO, A. B., SWEDEN
BRUNNER & LAY, INC.
BUCYRUS-ERIE CO.
CARSET—SEE INGERSOLL-RAND CO.
Cleveland Rock Drill Div., Westinghouse Air Brake Co.
DEMAG AKTIENGESSELLSCHAFT
Firth Sterling, Inc.
GARDNER-DENVER CO.

General Electric Co., Carbology Dept.

Hillman Co., Inc., C. Kirk
Holman Bros. Ltd., (England)
Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
KENNAMETAL INC.
LIDDICOAT—SEE WESTERN ROCK BIT MFG. CO.
Manchester Bit Corp.
McCauley Industrial Corp.
Metal Carbides Corp.
Minerals Engineering Co., (Colo.)
Mobile Drilling Inc.
Powermite Drill & Tool Co.
Rip-Bits, Ltd.
ROK BITS—SEE BRUNNER & LAY, INC.
SANDVIK COROMANT—SEE ATLAS COPCO PACIFIC, INC.
Thor Power Tool Co.
Throwaway Bit Corp.
TIMKEN—SEE TIMKEN ROLLER BEARING CO.
TIMKEN ROLLER BEARING CO.
Tungstone—see Minerals Eng. Co.
Vascoloy—Ramet Corp.
WESTERN ROCK BIT MANUFACTURING CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

ROTARY BITS

ACKER DRILL CO., INC.
BLUE DEMON—SEE HAWTHORNE, INC., HERR J.
Central Mine Equipment Co.
CHICAGO PNEUMATIC TOOL CO.
Damco—see Drilling Accessory & Mfg. Co., Inc.
Demo Tool Co.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo.
Firth Sterling, Inc.
Firthite—see Firth Sterling, Inc.
GARDNER-DENVER CO.
General Electric Co., Carbology Dept.
HAWTHORNE, INC., HERR J.
HITCHCOCK MFG. CO., LEO
Hoffman Bros. Drilling Co.
HUGHES TOOL CO.
KENNAMETAL INC.
Kerfmaster—see Central Mine Equipment Co.
LONGYEAR CO., E. J.
Mobile Drilling, Inc.
OIL TOOL MFG. CO.
Porto Tool Co.
Powermite Drill & Tool Co.
STANCO MFG. & SALES, INC.
Stripmaster—see Central Mine Equipment Co.
Thor Power Tool Co.
VAREL MFG. CO.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co., Le Roi Div.
WINTER WEISS CO., THE

BLASTING SUPPLIES**BLASTING MACHINES**

ATLAS POWDER CO.
BC-2 Blaster—see Electro-Technical Labs.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., E. I., EXPLOSIVES DIV.
Electro-Technical Labs.
Hercules Powder Co.
Olin Mathieson Chem. Corp., Explosives Div.
SHOT MASTER—SEE ATLAS POWDER CO.
Sly Mfg. Co., W. W., The
Trojan Powder Co.

DETONATING FUSES

American Cyanamid Co., Organic Chemicals Div.
ATLAS POWDER CO.
Canadian Safety Fuse Co., Ltd.
Coeur d'Alene Hardware & Foundry Co.

DU PONT DE NEMOURS & CO., E. I., EXPLOSIVES DIV.
Ensign Bickford Co., The
Hercules Powder Co.
Olin Mathieson Chem. Corp., Explosives Div.
Primacord—see Canadian Safety Fuse Co., Ltd.
Trojan Powder Co.

ELECTRIC CAPS

AMERICAN CYANAMID CO., EXPLOSIVE DEPT.
ATLAS POWDER CO.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., INC., E. I., EXPLOSIVES DIV.
Hercules Powder Co.
Olin Mathieson Chem. Corp., Explosives Div.
ROCKMASTER—SEE ATLAS POWDER CO.
SPENCER CHEMICAL COMPANY
Trojan Powder Co.

EXPLOSIVES

Accomite—see American Cyanamid Co., Organic Chem. Div.
AMERICAN CYANAMID CO.
Apache Powder Co.
ATLAS-GIANT—SEE ATLAS POWDER CO.
ATLAS POWDER CO.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., INC., E. I., EXPLOSIVES DIV.
Hercules Powder Co.
Illinois Powder Mfg. Co.
International Geophysics, Inc.
King Powder Co., The
Multiplex—see International Geophysics, Inc.
Olin Mathieson Chem. Corp., Explosives Div.
SPENCER CHEMICAL COMPANY
Trojan Powder Co.

SAFETY FUSES

ATLAS POWDER CO.
Black Clover—see Canadian Safety Fuse Co., Ltd.
Canadian Safety Fuse Co., Ltd.
Coeur d'Alene Hardware & Foundry Co.
COAST MFG. & SUPPLY CO.
DU PONT DE NEMOURS & CO., E. I., EXPLOSIVES DIV.
Ensign Bickford Co., The
Hercules Powder Co.
National Fuse & Powder Co.
Olin Mathieson Chem. Corp., Explosives Div.
Trojan Powder Co.

ACCESSORIES—other than above

AMERICAN CYANAMID CO., EXPLOSIVE DEPT.
ATLAS POWDER CO.
Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., INC., E. I., EXPLOSIVES DIV.
Economy Fuse & Mfg. Co.
Ensign-Bickford Co.
Hercules Powder Co.
Johnson Loading Supplies, G. R.
Lock-Hook—see Johnson Loading Supplies, G. R.
MAHOGANY IMPORTING CO.
MINE SAFETY APPLIANCES CO.
Minnesota Mining & Mfg. Co.
Irrington Varnish & Insulator
National Fuse & Powder Co.
National Mine Service Co.
Olin Mathieson Chem. Corp., Explosive Dept.
Plastic Tamping Stick Sales
Primacord—see Ensign-Bickford Co.
Tamping Bag Co., The
Thermalite—see Canadian Safety Fuse Co., Ltd.
Trojan Powder Co.

BLOCKS & SHEAVES

See also Conveyor Equipment

All Casteel—see Vulcan Iron Works (Pa.)
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP, EXPORT DIV.
ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO.
American Hoist & Derrick Co., Crosby-Laughlin Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
CARD IRON WORKS CO., THE C. S.
Crosby Load Rated—see Amer. Hoist & Derrick
DEMAG AKTIENGESSELLSCHAFT
Dodge Manufacturing Corp.
DUROLITE—SEE SAUERMAN BROS., INC.
GRIPHIST, INC.
HADFIELD LTD.
HEWITT-ROBINS, INC.
Hockensmith Corp., The
Jones Foundry & Machine Co., W. A.
JOY MANUFACTURING CO.
KEENEY CO., PAUL E.
LAKE SHORE INC.
MCLEANAHAN & STONE CORP.
NATL. MALLEABLE & STEEL CASTINGS CO.
Nat'l. Supply Co., The
Ogden Iron Works Co.
Ohio Hoist & Mfg. Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
Page Engr. Co.
Princeton Grapohist Inc.
RIBLET TRAMWAY CO.
ROPE MASTER—SEE KEENEY CO., PAUL E.
Sanford-Day Iron Works, Inc.
SAUERMAN BROS., INC.
SKOOKUM CO.
Taper-Lock—see Dodge Mfg. Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Tool Steel Gear & Pinion Co., The
VULCAN IRON WKS. CO., (COLO.)
VULCAN IRON WORKS CO. (PA.)
Washington Iron Wks.
Worthington Corporation
Yuba Manufacturing Co.

BLOWERS

See Ventilation Equipment and Blowers

BODIES

See Trucks and Trailers; Mine Cars

BOLTS, ROCK

BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CF&I—SEE COLORADO FUEL & IRON CORP., THE
COLORADO FUEL & IRON CORP., THE
Commercial Shearing & Stamping Co., The
Elreco Corp., The
Ohio Brass Co.
Oliver Iron & Steel Corp.
Republic Steel Corp.
SHEFFIELD STEEL DIV.
ARMCO STEEL CORP.
TELLURIDE IRON WKS.
U. S. Industries Inc.
U. S. Steel Corp.—Tennessee Coal & Iron Div.
United States Steel Export Co.
Youngstown Sheet & Tube Co., The

BOOM ASSEMBLIES

See Drills; Excavators and Attachments

BRAKES

DRUMS AND MECHANISMS LINING

See Friction Material

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Brushes, Electrical

BRUSHES, ELECTRICAL

See Electrical Equipment

BUCKETS

See also Hoisting Equipment:
Tramways, Aerial; Dredges and
Dredge Buckets; Conveyor
Equipment

DRAGLINE BUCKETS

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
BUCYRUS-ERIE CO.
CRESCENT—SEE SAUERMAN
BROS. INC.
ELECTRIC STEEL FOUNDRY
ESCO—SEE ELECTRIC STEEL
FOUNDRY
Page Engr. Co.
Pettibone Muliken Corp.
RED ARCH—SEE BUCYRUS-
ERIE CO.
SAUERMAN BROS. INC.
Taylor-Wharton Iron & Steel Co.

GRAB BUCKETS

Blaw-Knox Co., Blaw-Knox Div.
Hais Mfg. Co., Geo.
HARNISCHFEGGER CORP.
Kochring Co.
Link Belt Speeder Corp.
Owen Bucket Co.

POWER SHOVEL DIPPERS

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
BUCYRUS-ERIE CO.
ELECTRIC STEEL FOUNDRY
ESCO—SEE ELECTRIC STEEL
FOUNDRY
Pettibone Muliken Corp.
Taylor-Wharton Iron & Steel Co.

BUILDINGS,

PREFABRICATED

ALLISON STEEL MFG. CO.
Aluminum Co. of America
Armo Drainage & Metal Products,
Inc.
BETHLEHEM PACIFIC COAST
STEEL CORP.
Bethlehem Steel Co.
Black, Sivalls & Bryson, Inc.
Blaw-Knox Co., Blaw-Knox Div.
Butler Manufacturing Co.
COLUMBIAN STEEL TANK CO.
Republic Steel Corp., Truscon Steel
Div.
Soulé Steel Co.
Truscon—see Republic Steel Corp.
U. S. Steel Corp., American Bridge
Div.
UNITED STATES STEEL
EXPORT CO.

BULLDOZERS

See Tractors and Attachments

BURNERS, OIL & GAS

BARCOCK & WILCOX CO., THE
DFC—SEE DENVER FIRE CLAY
CO., THE
DENVER FIRE CLAY CO., THE
GENERAL MOTORS OVERSEAS
OPERATIONS
Iron Fireman Mfg. Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
MINE & SMELTER SUPPLY CO.
National Aircel Burner Co.
Surface Combustion Corp.

BUYERS OF ORES AND CONCENTRATES

See "Possible Markets Ores,
Metals and Non-metals"
elsewhere in this edition

CABLE AND CONDUIT

See also Rope, Wire; Tramway,
Aerial

ELECTRICAL CABLE AND CONDUIT

Alphaduct Wire & Cable Co.
Aluminum Co. of America
ANACONDA WIRE AND CABLE
CO.
Ankossal—The Ansonia Wire &
Cable Company
Ansonia Wire & Cable Company,
The
BETHLEHEM PACIFIC COAST
STEEL CORP.
British Insulate Callender Cables,
Ltd.
Buckeye—see Youngstown Sheet &
Tube Co.
C M G Industries
Canada Wire & Cable Co., Ltd.
Carlson Prod. Corp.
Carol Cable Co.
Chase Brass & Copper Co.
Circle Wire & Cable Corp.
Collyer Insulated Wire Co.
Electriduct—see CMG Industries
Essex Wire Corp.
Flex-A-Power—see General Electric
Co.
GENERAL CABLE CORP.
General Electric Co.
General Electric Co., Construction
Materials Dept.
General Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.
Hazard—see Okonite Co.
Hazard Insulated Wire Wks.
International General Electric Co.
Johns-Manville Sales Corp.
Korduct—see Johns-Manville Corp.
Lowell Insulated Wire Corp.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIVISION
Minnesota Mining & Mfg. Co., Irvin-
gton Varnish & Insulator
Division
Mosebach Electric & Supply Co.
National Supply Co., The
OKONITE COMPANY, HAZARD
INSULATED WIRE WORKS
Paranite—see Essex Wire Corp.,
Paranite Wire and Cable Div.
Phelps Dodge Copper Products
Corp.
ROEBLING'S SONS CORP., JOHN
A
Rome Cable Corp.
Rome 60—see Rome Cable Corp.
Siemens & Halske A. G.
SIMPLEX WIRE & CABLE CO.
Spang—see National Supply Co.,
The
TIGER BRAND—SEE U. S. STEEL
EXPORT CO.
Transite—see Johns-Manville Sales
Corp.
United States Rubber Co.
U. S. STEEL CORP., AMERICAN
STEEL & WIRE DIV.
United States Steel Corp., Columbia
Geneva Steel Div.
UNITED STATES STEEL EXPORT
CO.
Western Insulated Wire Co.
Youngstown Sheet & Tube Co., The

CABLEWAYS, EXCAVATING

See Excavators

CAGES

See Hoisting Equipment

CALCINERS

See Dryers and Kilns;
Pyrometallurgical Equipment

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CAPS

See Blasting Supplies

CARBIDE

CALCIUM—See also Tungsten
Carbide Products

Air Reduction Sales Co.
INDUSTRIAL AIR PRODUCTS
CO.
Monsanto Chemical Co.
National Carbide Co.
National Cylinder Gas Co.
Shawinigan Prod. Corp.
Union Carbide & Carbon Corp.—
Linde Air Products Co.

CARS, MINE

See also Haulage Units, Off-rail

A C F Industries, Inc. American
Car & Foundry Div.
ALLISON STEEL MFG. CO.
ATLAS CAR & MFG. CO., THE
BALDWIN - LIMA - HAMILTON
CORP.
BETHLEHEM PACIFIC COAST
STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Bischoff-Werke K. G.
CARD IRON WORKS CO., THE,
C. S.
Coeur d'Alene Hardware & Foundry
Co.
DART TRUCK CO.
Differential Steel Car Co.
Easton Car & Construction Co.
GETMAN BROS. MFG. DIV., INC.
Gregg Co., Ltd., The
Hirsch Bros. Machinery Co.
Hoekersmith Corp. The
Hudson, Robert, Ltd.
Irwin Foundry & Mine Car Co.
Kaiser Steel Corp.
LAKE SHORE INC.
Landis Steel Co.
LOHED—SEE LAKE SHORE, INC.
Magor Car Corp.
MAYO TUNNEL & MINE EQUIP.
MINERS FOUNDRY & MFG. CO.
NC-1—SEE NATIONAL MALLE-
ABLE & STEEL CASTINGS
CO.
NATIONAL IRON CO.
NATIONAL MALLEABLE &
STEEL CASTINGS CO.
Ogden Iron Works Co.
Pacific Car & Foundry Co.
Sanford-Day Iron Works Co.
SCOOT-CRETE ORE CARRIER—
SEE GETMAN BROS. MFG.
DIV., INC.
TELLURIDE IRON WORKS
Union Iron Works
U. S. Industries, Inc.
U. S. Industries Inc. Iron Works
UNITED STATES STEEL CORP.—
AMERICAN BRIDGE DIV.
U. S. Steel Corp., Columbia Geneva
Steel Div.
UNITED STATES STEEL COR-
PORATION
U. S. S.—SEE UNITED STATES
STEEL CORPORATION
UNITED STATES STEEL EXPORT
CO.
Watt Car & Wheel Co., The
Westinghouse Air Brake Co., Le
Roi Div.

AXELS, WHEELS AND TRUCKS

See above

CAR PASSERS

AMERICAN MINE DOOR COM-
PANY
CANTON—SEE AMERICAN MINE
DOOR COMPANY
CARD IRON WKS.
MAYO TUNNEL & MINE EQUIP.
MINERS FOUNDRY & MFG. CO.
TELLURIDE IRON WORKS CO.

CAR SHAKERS

See Shakers, Car

CELLS, FLOTATION

See Flotation Machines

CHAIN AND

ACCESSORIES

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
American Chain & Cable Co., Inc.,
American Chain Div.
Amer. Hoist & Derrick Co., Crosby-
Laughlin Div.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Bowdill Co., The
Chain Belt Co., The
ELECTRIC STEEL FOUNDRY CO.
JEFFREY MANUFACTURING CO.
Laughlin—see Amer. Hoist & Der-
rick Co.
Laughlin Co., The, Thomas
LINK-BELT CO.
NATIONAL MALLEABLE &
STEEL CASTINGS CO.
Ohio Gear Co., The
Page Engr. Co.
Republic Steel Corp.
Rex—see Chain Belt Co., The
Ryerson & Son, Inc., Joseph T.
STEPHENS-ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
Thiele, August G.m.b.H.
Tisco—see Taylor-Wharton Iron &
Steel Co.
Thomas Laughlin Div., American
Hoist & Derrick Co.
Wilmot Engineering Co.

CHAIN HOISTS

ALLISON STEEL MFG. CO.
American Chain & Cable Co.,
Wright Hoist Div.
ATLAS COPCO AB, SWEDEN
CHICAGO PNEUMATIC TOOL CO.
Coffing Hoist Div., Duff-Norton Co.
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGGER CORP.
International Combustion (Export)
Ltd.
Loading—see Yale & Towne Mfg.
R & M—see Robbins & Myers, Inc.
Republic Steel Corp.
Robbins & Myers, Inc.
Yale and Towne Mfg. Co.

CHARGERS, BATTERY

ELECTRIC STORAGE BATTERY
CO., THE EXIDE INDUS-
TRIAL DIV.
Fairbanks, Morse & Co.
General Electric Co., Apparatus
Sales Div.
GOODMAN MANUFACTURING
COMPANY, MANCHA STOR-
AGE BATTERY LOCOMOTIVE
DIV.
Gould-National Batteries, Inc.
GRAYBAR ELECTRIC CO., INC.
GREENSBURG MACH. CO.
Hobart Bros.
International General Electric Co.
Kohler Co.
Lincoln-Electric Co.
Lister-Blackstone, Inc.
Lynn Engr. Supply Co.
Lynco Powerhouse—see Lynn
Engr. & Supply Co.
Motor Generator Corp.
Onan & Sons, Inc., D. W.
"Precision-charge"—see Lincoln
Electric Co.
Sheppard Co., R. H.
SYNTRON CO.
Ward Leonard Electric Co.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
Westinghouse Electric Corp.

CHEMICAL CONCENTRATORS

See Concentrating Equipment

CHEMICALS

See Reagents and Chemicals

CHIMNEYS

Consolidated Chimney Co.
**HEAD WRIGHTSON, STOCKTON
FORGE LTD.**

CHUTES

See Bins, Chutes and
Accessories; Feeders

CLAMPS

See Couplings, hose; Rope, Wire

CLARIFIERS

See Filters, Concentrate;
Thickeners and Tanks

CLASSIFIERS

See also Cyclones

AIR

Combustion Engineering Inc., Ray-
mond Div.
Gayco-Reliance—see Universal Road
Mach Co.
General Elec. Co. of England, Ltd.
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-
Deutz, A. G.
International Combustion Ltd.
International Engr., Inc.
**KENNEDY-VAN SAUN MFG. &
ENG. CORP.**
Klockner-Humboldt-Deutz A. G.
Loesche, Germany
Majac, Inc.
McNally Pittsburgh Mfg. Co.
Osborne Pulse-cone—see Osborne
Labs, Inc.
Roberts & Schaefer
Scott's Concentrators
STURTEVANT MILL CO.
Universal Road Machinery Co.
Williams Patent Crusher & Pulver-
izer Co.

HYDRAULIC

**AKINS—SEE MINE & SMELTER
SUPPLY CO., THE**
**CONCENCO—SEE DEISTER CON-
CENTRATOR CO., THE**
**DEISTER CONCENTRATOR CO.,
THE**
Deister Machine Co.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Dresser Stacey Co.
Dunham Mfg. & Sales Co., Gordon
S
Eagle Iron Works
EQUIPMENT ENGINEERS INC.
Fraser & Chalmers Engr. Wks.
General Electric Co. of England,
Ltd.
Georgia Iron Wks.
Gibson, W. W.
HARDINGE CO., INC.
Heyl & Patterson, Inc.
**KENNEDY-VAN SAUN MFG. &
ENG.**
Klockner-Humboldt-Deutz A. G.
Knapp & Bates, Ltd.
**KREBS—SEE EQUIPMENT ENG.,
INC.**
McNally Pittsburgh Mfg. Co.
**MINE & SMELTER SUPPLY CO.,
THE**
Smith Engineering Works
TELLURIDE IRON WORKS CO.
**WEMCO—SEE WESTERN MACH.
CO.**
WESTERN MACH. CO.
Wilmot Engineering Co.

MECHANICAL

**AKINS—SEE COLORADO IRON
WORKS CO. & HEAD
WRIGHTSON, STOCKTON
FORGE LTD.**
Bird Machine Co.
Bodinson Mfg. Co.
Bush Engineering & Mfg. Co.
COLORADO IRON WORKS CO.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Eagle Iron Works
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
HARDINGE CO., INC.

**HEAD WRIGHTSON, STOCKTON
FORGE LTD.**
Humboldt, Klockner-Humboldt-
Deutz, A. G.
Iowa Mfg. Co.
**KENNEDY-VAN SAUN MFG. &
ENG. CORP.**
Klockner-Humboldt-Deutz A. G.
Knapp & Bates Ltd.
LINK-BELT CO.
Lippmann Engineering Works
Magnetic Engineering & Mfg. Co.
**MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.**
Miners Foundry & Mfg. Co.
MORSE BROS. MACHINERY CO.
Roberts & Schaefer Co.
Smith Engineering Works
**SOUTHWESTERN ENGINEERING
CO.**
Straub Mfg. Co., Inc.
STURTEVANT MILL CO.
T. & R.—see Bush Eng. & Mfg. Co.
**TRULINE—SEE MORSE BROS.
MACHINERY CO.**
Union Iron Works
**WEMCO—SEE WESTERN MA-
CHINERY CO.**
WESTERN MACHINERY CO.

CLEANERS

See Filters; Scrubbers

CLOTH

See Filter Media; Screens, Griz-
zles and Accessories, Ventila-
tion Equipment

CLOTHING

See Safety Equipment

CLUTCHES

MECHANISMS

Air-Grip (see Dodge Mfg. Co.)
Cutler-Hammer, Inc.
Diamond-D. (see Dodge Mfg. Co.)
Dodge Mfg. Co.
Eaton Mfg. Co. Dynamic Divn.
LINK-BELT CO., EXPORT DIV.
Marland One-Way Clutch Co.
Morse Chain Co.
Rolling-Grip—see Dodge Mfg. Co.
STEPHENS-ADAMSON MFG. CO.
Twin Disc Clutch Co.

FACING & LINING

See Friction Material

COLLECTORS

See Dust Collection Equipment;
Reagents and Chemicals

COLUMNS

See Arms and Posts

COMMUNICATIONS

BELL AND BUZZER SYSTEMS

Adaptabel—see Edwards Co., Inc.
Adaptahorn—see Edwards Co., Inc.
Connecticut Telephone & Electric
Corp.
Edwards Co., Inc.
General Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.
Lunger—see Edwards Co., Inc.
Signal Engr. & Mfg. Co.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

MINE TELEPHONES

Connecticut Telephone & Electric
Corp.

Edwards Co., Inc.
General Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.
MINE SAFETY APPLIANCES CO.
SIMPLEX WIRE & CABLE CO.
Sound Power, see United States In-
strument Corp.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

RADIO SYSTEMS

Alpine Laboratories, Ltd.
Connecticut Telephone & Electric
Corp.
Fleetway—see Connecticut Tele-
phone & Electric Corp.
Generer Electric Co. of England,
Ltd.
GRAYBAR ELECTRIC CO., INC.
Hycon Aerial Surveys, Inc.
**INTERNATIONAL GENERAL
ELECTRIC CO.**
International Geophysics, Inc.
MINE SAFETY APPLIANCES CO.
Motorola Communications & Elec-
tronics, Inc.
Sterling Siren Fire Alarm Co., Inc.
**WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.**

TROLLEY TELEPHONES

MINE SAFETY APPLIANCES CO.
Sterling Siren Fire Alarm Co., Inc.

COMPRESSORS & ACCESSORIES

PORTABLE

**ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP**
**AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.**
**AMSCO—SEE AMERICAN BRAKE
SHOE CO.**
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN
ATLAS COPCO PACIFIC, INC.
Borsig AG.
Carrier Corp.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.
Davey Compressor Co.
**DEMAG AKTIENGESSELLSCHAFT
GARDNER-DENVER CO.**
GOODMAN MFG. CO.
**GYRO-FLOW—SEE INGERSOLL-
RAND CO.**
Holman Bros., Ltd. (England)
Holman Brothers (Canada) Limited
INGERSOLL-RAND CO.
Jaeger Machine Co., The
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air
Brake Co.
Olin Mathieson Chem. Corp., Explo-
sives Div.
Power-Vane, see Consolidated Pneu-
matic Tool Co., Ltd.
Powernite Drill & Tool Co.
Schramm Inc.
**UNTAIR—SEE JOY MANUFAC-
TURING CO.**
Westinghouse Air Brake Co., Le
Roi Div.
Westinghouse Air Brake Co. (Pa.)
Worthington Corp.

STATIONARY

**ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP**
American Blower Div. of American
Standard
**AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.**
**AMSCO—SEE AMERICAN BRAKE
SHOE CO.**
ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Borsig AG.
Carrier Corp.
**CHICAGO PNEUMATIC TOOL
CO.**
Consolidated Pneumatic Tool Co.,
Ltd.
Cooper-Bessemer Corp., The
DeLaval Steam Turbine Co.

Concentrating Equipment

**DEMAG AKTIENGESSELLSCHAFT
GARDNER-DENVER CO.**
General Electric Co. of England,
Ltd.
Holman Bros., Ltd., (England)
Holman Brothers (Canada) Limited
INGERSOLL-RAND CO.
Jaeger Machine Co., The
JOY MANUFACTURING CO.
Lima Electric Motor Co., The
Olin Mathieson Chem. Corp., Explo-
sives Div.
**RO-FLO—SEE ALLIS-CHAL-
MERS MFG. CO., INDUS-
TRIES GROUP**
Roots-Connorsville Blower Corp.
Schramm Inc.
Spiraxial—see Roots-Connorsville
Blower
Techn. Ind. en Handelsonderneming
Wedag A.G.
Westinghouse Air Brake Co., Le
Roi Div.
Worthington Corp.

CONCENTRATING EQUIPMENT

See also Classifiers; Flotation
Machines, Magnetic Equipment

HEAVY MEDIA SEPARATION

**AKINS—SEE MINE & SMELTER
SUPPLY CO., THE**
**ATKINS—SEE COLORADO IRON
WORKS CO.**
**ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP**
COLORADO IRON WORKS CO.
Dings Magnetic Separator Co.
DRAYO CORP.
Filter Fabrics, Inc.
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
HARDINGE CO., INC.
**HEAD WRIGHTSON, STOCKTON
FORGE LTD.**
HEWITT-ROBINS, INC.
Humboldt Klockner-Humboldt-
Deutz, A. G.
JEFFREY MANUFACTURING CO.
**KENNEDY-VAN SAUN MFG. &
ENGR. CORP.**
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
Magnetic Engineering & Mfg. Co.
McNally Pittsburgh Mfg. Co.
Memco—see Magnetic Engineering
& Mfg. Co.
**MINE & SMELTER SUPPLY CO.,
MORSE BROS. MACH. CO.**
**O. C. C.—SEE ORE & CHEMICAL
CO.**
ORE & CHEMICAL CO.
Osborne Laboratories, Inc. Ray-
mond G.
Rapid Magnetic Machines, Ltd.
Simplicity Engineering Co.
Southwestern Engr. Co.
Stearns Magnetic, Inc.
STEARNS-ROGER MFG. CO., THE
Tennant Sons & Co., C. of N.Y.
**WEMCO MOBILE-MILL—SEE
WESTERN MACHINERY CO.**
WESTERN MACHINERY CO.
Wilmot Eng. Co.
Yuba Consolidated Industries, Inc.

FANNING

Carpco Mfg. Co.
ION EXCHANGE EQUIPMENT
**ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP**
DENVER EQUIPMENT CO.
DORR-OLIVER CO.
Hack Engineering Co.
INFILCO, INC.
Peterson Filters & Engineering Co.
**SOUTHWESTERN ENGINEERING
CO.**
Standard Steel Corp.
STEARNS-ROGER MFG. CO.
TYLER CO., W. S.
Universal Dredge Mfg. Co.
WESTERN MACHINERY CO.

JIGS

Bavaria Maschinenfabrik
Bendelari, F. N.
Bodinson Mfg. Co.
Coeur d'Alene Hardware & Foundry
Co.
DENVER EQUIPMENT CO.
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-
Deutz, A. G.

**Manufacturer's Complete Names and Ad-
dresses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

Concreting Equipment, Underground

I. H. C. Holland
James Equipment Inc.
JEFFREY MANUFACTURING CO.
"Jimmy"—see James Equipment, Inc.
KENNEDY-VAN SAUN MFG. CO.
Knapp & Bates, Ltd.
Klockner-Humboldt-Deutz A. G.
Krupp, Fried-Maschinen und Stahlbau-Rheinhausen
LINK-BELT CO.
McLanahan & Stone Corp.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
MORSE BROS. MACHINERY CO.
Osborne Laboratories, Inc., Raymond G.
Universal Dredge Mfg. Co.
WEMCO-REMER—SEE WESTERN MACHY. CO.
WESTERN MACHY. CO.
Wilnot Eng. Co.
Yuba Mfg. Div.

SPIRAL CONCENTRATORS

DENVER EQUIPMENT CO.
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
HUMPHREYS INVESTMENT CO.
Jeffrey Mfg. Co.

TABLES

Bavaria Maschinenfabrik
BUCKMAN TILING CONCENTRATOR—SEE DENVER EQUIP. CO.
Carpo Mfg., Inc.
CONCENCO—SEE DEISTER CONCENTRATOR CO. THE DEISTERPLAT-O—SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
Deister Machine Co.
DENVER EQUIPMENT CO.
DUNHAM MFG. & SALES CO., GORDON S.
Fraser & Chalmers Engr. Wks.
General Electric Co. of England, Ltd.
Gibson, W. W.
Humboldt, Klockner-Humboldt-Deutz, A. G.
James Equipment, Inc.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
LINK-BELT CO. EXPORT DIV.
MINE & SMELTER SUPPLY CO.
Minerals et Metaux
MORSE BROS. MACHINERY CO.
Osborne Laboratories, Inc., Raymond G.
Roberts & Schaefer Co.
Scott's Concentrators
Snyder Mine & Chemical Lab.
Straub Mfg. Co., Inc.
SUPER DUTY DIAGONAL-DECK—SEE DEISTER CONCENTRATOR CO.
Universal Dredge Mfg. Co.
WILEY—SEE MINE & SMELTER SUPPLY CO. THE YUBA MANUFACTURING CO.

CHEMICAL CONCENTRATORS

Drullard Co., Howard
Humboldt, Klockner-Humboldt-Deutz, A. G.
INFILCO, INC.
KENNEDY-VAN SAUN MFG. & CO.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
Snyder Mine & Chemical Lab.
STEARNS—ROGER MFG. CO.
WESTERN MACHY. CO.

CONCRETING

EQUIPMENT, UNDERGROUND

See also Grouting, Pneumatic Concrete Placing
Air Placement Equip. Co.
Airplace—see Air Placement Equip. Co.
Blaw-Knox Co.
Bondactor—see Air Placement Equip. Co.
CEMENT GUN CO.
Cementation Co. Ltd., The
Chain Belt Co.
CHICAGO PNEUMATIC TOOL CO.
Construction Mach. Co.
Grout-or Blast—see Air Placement Equip. Co.
GUNIT—SEE CEMENT GUN CO.
Jaeger Machine Co., The
MAYO TUNNEL & MINE EQUIP.
Mix-elevator—see Air Placement Equip. Co.

Nucretor—see Air Placement Equip. Co.
Rex—see Chain Belt Co.
Torkret G.m.b.H.

CONDITIONERS

See Agitators and Conditioners

CONDUIT

See Cable and Conduit

CONSTRUCTION,

MINE PLANT

See Plant Design and Construction

CONSULTING

METALLURGICAL

ENGINEERS

Hazen, H. L.
Keegel, C. P.
Krebs, Kellogg
Talbot, H. L.

CONSULTING MINING

ENGINEERS AND

SERVICES

Alderman, Jr., Sidney S.
BAILEY & VAN HORN
Baukol, Philip J.
CHAPMAN, WOOD & GRISWOLD
COWIN & CO., INC.
DALE, WADE M.
Davis & Davis
EAKLAND & OSTERSTOCK
Earle, Norton K.
FREDERICK, FRANCIS H.
Gardner, E. D.
Geo-Engineering
Geo-Professional Services, Inc.
GOULD & CO., GORDON I.
Ingersoll, Guy E.
Johnson, Herbert Banks
KANE, WM. G.
Keegel, C. P.
Linta, Mark
LONGYEAR CO., E. J.
LOOFBOUROW, E. L.
MacAfee & Co.
MCILLAN, W. D.
MEISSNER ENGRG. INC., J. F.
Miller, Arnold H.
Mineral Engineering Co. (Calif.)
O'Donnell & Schmidt
O'KEEFE, JOHN J.
PENA ASSOCIATES
Pierce, Roger V.
PIGGOTT PROJECTS
Pinger, Allen W.
SCHAEFER & ASSOCIATES, F. C.
SCHIEDENHELM, F. W.
Smerchanski, Mark G.
Schroter & Lockwood
Shedwick, Jr., Wm. J.
Sherman, Howard P.
STILL & STILL
THOMAS, CONRAD W.
TURNER & ASSOCIATES
Uranium Exploration
Willey, C. R.
WISSER & COX
Harry J. Wolf
WILSON EXPLORATION CO.
World Mining Consultants Inc.

CONTINUOUS MINERS

Goodman Mfg. Co.
JEFFREY MFG. CO.
JOY MFG. CO.
National Mine Service Co.

Scott's Concentrators
Westinghouse Air Brake Co., Ld
Roi Div.

CONTROL EQUIPMENT

See Testing, Recording, and Control Equipment

CONVERTERS

See Electrical Equipment; Pyrometallurgical Equipment, Transmissions

CONVEYOR EQUIPMENT

See also Scales and Feeders

BELTS

AMERICAN BRAKE SHOE CO.
American Rubber Mfg. Co.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
Bear—see American Rubber Co.
Becker-Prunte, G.m.b.H.
Bischoff-Werke K. G.
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Boston Woven Hose & Rubber Co.
Carlyle Rubber Co., Inc.
Chain Belt Co.
Continental Gin Co.
Conveyor Co., The
Crackerjack—see American Rubber Co.
DEMAG AKTIENGESSELLSCHAFT
Eickhoff, Gebr. Maschinenfabrik A. G.
Eisengiesserei G.m.b.H.
EQUIPMENT ENG. INC.
Gates Rubber Co.
GOODALL RUBBER CO.
Goodrich Rubber Co.
Goodrich Co., B. F., Industrial Prod. Div.
Goodyear Tire & Rubber Co.
Grundler Crusher & Pulverizer Co.
GRUELL ENG. CO.
Hais Mfg. Co., Inc., Geo.
HEWITT-ROBINS INC.
Homocord—see Raybestos-Manhattan, Inc.
INTERNATIONAL B. F. GOOD-RICH
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Kort-Pettit Wire Fabrics & Iron Wks., Inc.
Lee Rubber & Tire Corp., Republic Rubber Div.
LINK-BELT CO.
Magnetic Engineering & Mfg. Co.
MAYO TUNNEL & MINE EQUIPMENT
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
National Mine Service Co.
Ogden Iron Works Co.
Pohl, J., A. G.
Porter Co., H. K., Quaker Rubber Co. Div.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.—see Porter Co., H. K.
Raybestos-Manhattan, Inc.
Ray-man—see Raybestos-Manhattan Co.
Record-Maker—see Lee Rubber & Tire Corp., Republic Rubber Div.
Republic Rubber Div., Lee Rubber & Tire Corp.
Rex—see Chain Belt Co.
Richardson Scale Co.
Smith Engineering Works
Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
Super Excelo—see Lee Rubber & Tire Corp., Republic Rubber Div.

Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS. THERMOID CO.
Thiele, August, G.m.b.H.
Thor Power Tool Co.
Treadwell Co., Inc., M. H.
Trowbridge—see Magnetic Engineering & Mfg. Co.
Turner Bros. Asbestos Ltd.
United States Rubber Ltd.
U. S. STEEL EXPORT CO.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Div.
Yosemite—see American Rubber Mfg. Co.

BUCKETS

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
Bodinson Mfg. Co.
Chain Belt Co.
Christian Engineers, J. D.
Columbia Steel Casting Co., Inc.
Continental Gin Co.
Conveyor Co., The
EQUIPMENT ENG., INC.
Fa. Tena Paa & Co.
General Electric Co. of England, Ltd.
Grundler Crusher & Pulverizer Co.
HACK ENG. CO.
HEWITT-ROBINS, INC.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Koehring Co., Johnson Co., C. S., a subid.
LINK-BELT—SEE LINK-BELT CO.
Lippmann Engineering Works
Magnetic Engineering & Mfg. Co.
McDowell Co., Inc.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NATIONAL IRON CO.
Ogden Iron Works Co.
Owen Bucket Co., The
Pioneer Eng. Div., Poor & Co., Inc.
Rex—see Chain Belt Co.
Rogers Iron Works Co.
Salem Tool Co.
Sanford-Day Iron Works, Inc.
Sprout, Waldron & Co., Inc.
Stubbe, Albert
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Trowbridge—see Magnetic Engineering & Mfg. Co.
Thk-Lip—see Christian Engineers, J. D.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Watt Car & Wheel Co., The
Western Foundry Co.
Wilnot Engr. Co.
Yuba Manufacturing Div.

DRIVE AND TAIL PULLEYS

ACF Industries, Inc., American Car & Foundry Div.
AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
Bodinson Mfg. Co.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
DEMAG AKTIENGESSELLSCHAFT
Dodge Manufacturing Corp.
EQUIPMENT ENG., INC.
General Electric Co. Ltd., The
Grundler Crusher & Pulverized Co.
HADFIELD LTD.
Hais Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
Lippmann Engineering Works
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Ogden Iron Works Co.
Pohl, J., A. G.
Rex—see Chain Belt Co.
Rogers Iron Works Co.
Skookum Co., Inc., The
Smith Engineering Works
Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Stubbe, Albert
Taper-Lock—see Dodge Mfg. Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS
Treadwell Co., Inc., M. H.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Wamsco—see Washington Mach. Co.
Washington Mach. Co.
Wedg-Grip—see Christian Engineers, J. D.
Western Foundry Co.
Yuba Manufacturing Div.

ROLLERS

AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
Bodinson Mfg. Co.
Bonded—see Bonded Scale & Machine Co.
Bonded Scale & Machine Co.
British Jeffrey-Diamond Ltd.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co., Industrial Div.
Conveyor Co., The
EQUIPMENT ENG. INC.
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
Goodyear Tire & Rubber Co.
Grundler Crusher & Pulverizer Co.
HACK ENG. CO.
Hais Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
LIMBEROLLER—SEE JOY MFG. CO.
LINK-BELT CO.
Lippmann Engineering Co., E. F.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL CO.
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.
Pohl, J. A. G.
Rex—see Chain Belt Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS
Treadwell Co., Inc., M. H.
Universal—see Hack Eng. Co.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Co.

PILLOW BLOCKS AND HANGERS

AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co., Industrial Div.
Conveyor Co., The
Dodge Manufacturing Corp.
EQUIPMENT ENG. INC.
General Electric Co., Ltd., The
Grundler Crusher & Pulverizer Co.
HADFIELD LTD.
Hais Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
Iowa Manufacturing Co.
Jeffrey Manufacturing Co.
LINK-BELT CO.
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Ogden Iron Works Co.
Rex—see Chain Belt Co.
S K F Industries, Inc.
SEALMASTER—SEE STEPHENS-ADAMSON MFG. CO.
Skookum Co.
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
TELLURIDE IRON WKS.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Div.

CONVEYORS AND ELEVATORS

See also Feeders

BELT CONVEYORS

AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.
American Rubber Mfg. Co.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Athey Products Corp.
BARBER-GREENE CO.
Bodinson Mfg. Co.
Bonded Scale and Machine Co.
Boston Woven Hose & Rubber Co.
British Jeffrey-Diamond Ltd.
Broadbent, Robert & Son, Ltd.
Butler Mfg. Co.
Caryle Rubber Co., Inc.
Carpeo Mfg. Inc.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
Crackerjack—see American Rubber Mfg. Co.
DEMAG AKTIENGESellschaft
DENVER EQUIPMENT CO.
Diamond Iron Works Div., Goodman Mfg. Co.
Eickhoff, Gebr. Maschinenfabrik u. Eisengiesserei G.m.b.H.
Equipment Engineering Co.
Erich Maschinenbau
Fraser & Chalmers Engr. Wks.
Goodall Rubber Co.
GOODMAN MANUFACTURING CO.
GOODRICH CO., R. F. INDUSTRIA
PROD. DIV.
Grundler Crusher & Pulverizer Co.
HACK ENG. CO.
Hais Mfg. Co., Inc., Geo.
Hemseheid, Hermann Maschinenfabrik
HEWITT-ROBINS, INC.
HEWITT-ROBINS, INC. ROBINS CONVEYORS DIV.
Hirsch Bros. Machinery Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
INTERNATIONAL B. F. GOODRICH
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
Jeffrey Manufacturing Co.
JOY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CO.
Klockner-Humboldt-Deutz, A. G.
Korb-Pettit Wire Fabrics & Iron Works, Inc.
LAKE SHORE, INC.
Landis Steel Co.
Lee Rubber & Tire Corp., Republic Rubber Div.
LIMBEROPE—SEE JOY MFG. CO.
LINK-BELT CO.
Lippmann Engineering Works
M-H Standard Corp.
Magnetic Engineering & Mfg. Co.
Mavor & Coulson Ltd.
MAYO TUNNEL & MINE EQUIP.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
MINERS FOUNDRY & MFG. CO.
MORSE BROS. MACHINERY CO.
Ogden Iron Works Co.
Oliver Corp., The A. B. Farquhar Div.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.
Pioneer Rubber Mills
Porter Co., Inc., H. K., Quaker Rubber Div.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.
Raybestos-Manhattan, Inc.
READY—SPAN—SEE JOY MFG. CO.
REDI-FAB, SEE BARBER-GREENE CO.
Republic Rubber Div., Lee Rubber & Tire Corp.

Rex—see Chain Belt Co.
Rogers Iron Works Co.
Salzgitter Maschinen Aktiengesellschaft
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
TELLURIDE IRON WKS.
Thiele, August G.m.b.H.
THERMOID CO.
Treadwell Co., Inc., M. H.
Trowbridge—see Magnetic Engineering & Mfg. Co.
United States Rubber Co.
United States Rubber Intl.
U. S. STEEL EXPORT CO.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Westfälische Maschinenbau G.m.b.H.
Wood & Co. Ltd., Hugh
Yosemite—see American Rubber Mfg. Co.

BUCKET ELEVATORS

AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BARBER-GREENE CO.
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Butler Mfg. Co.
Carpeo Mfg. Inc.
Chain Belt Co.
Christian Engineers, J. D.
COLUMBIA STEEL CASTING CO., INC.
Continental Gin Co., Industrial Div.
Conveyor Co., The
Diamond Iron Works Div., Goodman Mfg. Co.
Equipment Engineering Co.
General Electric Co. of England, Ltd.
Grundler Crusher & Pulverizer Co.
HACK ENG. CO.
HEWITT-ROBINS, INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
INTERNATIONAL B. F. GOODRICH
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Jeffrey Manufacturing Co. The
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
Klockner-Humboldt-Deutz, A. G.
Koehring Co., Johnson Co., C. S. a subd.
LAK SHORE, INC.
Landis Steel Co.
LINK-BELT CO.
Lippmann Engineering Works
M-H Standard Corp.
Magnetic Engineering & Mfg. Co.
McLanahan & Stone
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.
Rogers Iron Works Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Treadwell Co., Inc., M. H.
Trowbridge—see Magnetic Engineering & Mfg. Co.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Watt Car & Wheel Co., The
Willmot Engineering Co.
Yuba Manufacturing Div.

SCREW

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Carpeo Mfg. Inc.
Chain Belt Co.

Conveyor Co., The
Continental Gin Co., Industrial Div.
Equipment Engineering Co.
Grundler Crusher & Pulverizer Co.
HACK ENGINEERING CO.
Hevi-Edge—see Christian Engineers, J. D.
Hirsch Bros. Machinery Co.
HOLO-FLITE — SEE WESTERN PRECIPITATION CO.
Humboldt, Klockner - Humboldt-Deutz, A. G.
JEFFERY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
Klockner-Humboldt-Deutz, A. G.
Koehring Co., Johnson Co., C. S.
Landis Steel Co.
LINK-BELT CO.
Lippmann Engineering Works
M-H Standard Corp.
Miners Foundry & Mfg. Co.
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engr. Div., Poor & Co., Inc.
Rex—see Chain Belt Co.
Richardson Scale Co.
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Watt Car & Wheel Co., The
WESTERN PRECIPITATION CO.

STEEL CONVEYORS

Westfälische Maschinenbau G.m.b.H.
SHAKING OR VIBRATING
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Carpeo Mfg. Inc.
Carrier Conveyor Corp.
Cleveland Vibrator Co., The
Continental Gin Co.
Conveyor Co., The
Fraser & Chalmers
General Electric Co., Ltd., The
GOODMAN MANUFACTURING CO.
Grundler Crusher & Pulverizer Co.
HACK ENG. CO.
Hauhinco, Maschinenfabrik
HEWITT-ROBINS, INC.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Internal Combustion (Export) Ltd.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
Simplicity Engr. Co.
Overstrom & Sons
SMITH & CO., F. L.
Stahlwerke Brunnshaus G.m.b.H.
STEPHENS-ADAMSON MFG. CO.
SYNTRON CO.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Vulcan Iron Works, Inc.
Watt Car & Wheel Co., The

STACKERS

JEFFERY MFG. CO.
PNEUMATIC
Spencer Turbine Co., The
Erie Manufacturing Co.
Flour Hartman, Div. Flour Products Co. Hartman A. G., Maschinenfabrik
U. S. Hoffman Machinery Corp.

COOLERS

See also Dryers & Kilns
ALLIS-CHALMERS MFG. CO.
AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Braun & Co., C. F.
Carrier Conveyor Corp.
Carrier Corp.
Christian Engineers, J. D.
DRAVO CORP.
HARDING CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE LTD.
HOLO-FLITE—SEE WESTERN PRECIPITATION CORP.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Coolers, Mine

Nichols Engineering & Research Corp.
NORDBERG MFG. CO.
 Ogden Iron Works Co.
PACIFIC FOUNDRY CO., LTD.
 Sarracco Tank & Welding Co.
SMITH & CO., F. L.
 Standard Steel Corp.
STEARNS ROGER MFG. CO.
 Surface Combustion Corp.
TRAYLOR ENGR. & MFG. CO.
 Washington Machinery Co.
WESTERN PRECIPITATION CORP.
WINDELER CO., LTD., GEORGE

COOLERS, MINE

Carrier Corp.
 International Engineering, Inc.

COOLING TOWERS

Carrier Corp.
NATIONAL TANK & PIPE CO.
 Ogden Iron Works Co.
 Pacific Wood Tank Corp.
 Santa Fe Tank Div., Flour Products Co.
WINDELER CO., LTD., GEO.

CORE BARRELS

ACKER DRILL CO., INC.
 American Coldset Corp.
BOYLES BROS. DRILLING CO., LTD., (CANADA)
DIAMOND DRILL CONTRACTING CO.
 Hitchcock Mfg. Co., Leo
JOY MFG CO.
 Mayhew Supply Co., Inc.
 McClintock, R. S.

COUNTERS, GEIGER,

OR SCINTILLATION

See Geiger Scintillation Counters

COUPLERS, CAR

AUTOMATIC—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
CARD IRON WORKS CO., THE
 Coeur d'Alene Hardware & Foundry Co.
 Differential Steel Car Co.
 Elmo Corp., The
 Gregg Co., Ltd., The
 Irwin Foundry & Mine Car Co.
MAYO AUTOMATIC—SEE MAYO TUNNEL & MINE EQUIP.
MAYO TUNNEL & MINE EQUIP.
MINERS FOUNDRY & MFG. CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
 Ohio Brass Co.
 Sanford-Day Iron Works Inc.
 Umco—see Utility Mine Equipment Co.
 Utility Mine Equipment Co.
WILLISON — SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.

COUPLINGS

See also Transmissions

HOSE

ATLAS COPCO AB, SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
 Band-It Co.
 Barco Mfg. Co.
 Bodinson Mfg. Co.
 Boston Woven Hose & Rubber Co.
CHICAGO PNEUMATIC TOOL CO.
CHIKSAN CO.
 Cleveland Div., Westinghouse Air Brake Co.
 Consolidated Pneumatic Tool Co., Ltd.
 Gates Rubber Co.
GOODALL RUBBER CO.
 Hose Accessories Co., Le-Hi Div.
 Ideal Corp.
INTERNATIONAL B. F. GOOD-RICH
 Le Hi Champ—see Hose Accessories Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 Pioneer Rubber Mills
 Punch-Lok Co.

Snap-Tite, Inc.
 Starns, Arner Corp.
THERMOID CO.
 Thor Power Tool Co.
 Trabon Engineering Corp.
 U. S. Rubber Intl.

PIPE

ATLAS COPCO AB, SWEDEN
ATLAS COPCO PACIFIC, INC.
 Band-It Co.
 Bethlehem Steel Co.
 Bodinson Mfg. Co.
CHIKSAN CO.
 Food Machinery & Chem. Corp., John Bean Div.
 Goodall Rubber Co.
 Grinnell Co., Inc.
 Gruvagrip—see Gustin-Bacon Mfg. Co.
 Gruvajoint—see Gustin-Bacon Mfg. Co.
 Gustin-Bacon Mfg. Co.
 Industrial Coupler Co.
INTERNATIONAL B. F. GOOD-RICH
 Johns-Manville Sales Corp.
MANNING CO., CHAS. E.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
 National Supply Co. (Pa.)
 Pacific Pipe Co.
 Porter Co., Inc., H. K., W-S Fittings Div.
 Ring-Tite—see Johns-Manville
 Rolagrip—see Gustin-Bacon Mfg. Co.
 Spang—see National Supply Co. (Pa.)
 Taylor Forge & Pipe Works
 Thor Power Tool Co.
 Victaulic Co. of America
 Walworth Co.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.

SHAFT & SHAFT FLEXIBLE

Airflex—see Falk Corp., The
 Bodinson Mfg. Co.
BROWN, INC., DAVID
 Chain Belt Co.
 Continental Gin Co.
 Diamond Chain Co.
 Dodge Mfg. Corp.
 Falk Corp., The
 Farrel-Bacon—see Farrel-Birmingham Co., Inc.
 Farrel-Birmingham Co., Inc.
 Fast's Self-aligning—see Koppers Co. Ind. Metal Prod. Div.
HEWITT-ROBINS, INC.
 Jeffrey Manufacturing Co.
 Koppers Co., Inc., Metal Prods. Div.
LINK-BELT CO.
 Morse Chain Co.
 Para-Flex—see Dodge Mfg. Corp.
 Philadelphia Gear Wks., Inc.
 Rex—see Chain Belt Co.
 Steelflex—see Falk Corp., The
 Taper-Lock—see Dodge Mfg. Co.
 Thomas Flexible Coupling Co.
 Western Gear Corp. (S. F.)

CRANES

BRIDGE

ALLISON STEEL MFG. CO.
 American Chain & Cable Co.
 Wright Hoist Div.
 American Hoist & Derrick Co., Crosby—Laughlin Div.
 Bodinson Mfg. Co.
DEMAG AKTIENGESellschaft
DRAGO CORP.
EQUIPMENT ENG., INC.
HACK ENGINEERING CO.
HARNISCHFEGGER CORP.
 Heyl & Patterson, Inc.
 Mannesmann Export G.m.b.H.
 Ohio Hoist & Mfg. Co.
 Pacific Coast Engr. Co.
 Pitman Manufacturing Co.
 Robbins & Myers, Inc.
 Schoonmaker Co., Inc., P. G.
 Shepard Niles Crane & Hoist Corp.
STEARNS ROGER MFG. CO.
 Thunes Mek. Verkted, A. S.
UNITED STATES STEEL CORP., AMERICAN BRIDGES DIV.
 Universal Dredge Mfg. Co.
 Wellman Engineering Co., The
 Yuba Mfg. Div. Yuba Consolidated Industries, Inc.

JIB

American Chain & Cable Co., Wright Hoist Div.
 American Hoist & Derrick Co., Crosby—Laughlin Div.
 Austin-Western & Lima A. W.
BALDWIN - LIMA - HAMILTON CORP.
 Bodinson Mfg. Co.

Clyde Iron Wks., Inc.
DEMAG AKTIENGESellschaft
HACK ENGINEERING CO.
HARNISCHFEGGER CORP.
LE TOURNEAU-WESTINGHOUSE CO.
 Ohio Hoist & Mfg. Co.
 Shepard Niles Crane & Hoist Corp.
 Thunes Mek. Verkted, A. S.
 Universal Dredge Mfg. Co.
 Yuba Mfg. Div.

TRUCK or TRACTOR MOUNTED

ALLIS-CHALMERS MFG. CO., CONST. MACHY. DIV.
 American Hoist & Derrick Co., Augsburg-Nurnberg AG, Maschinenfabrik (M.A.N.)
BALDWIN-LIMA-HAMILTON CORP.
 Bay City Shovels, Inc.
BUCYRUS ERIE CO., CONSTRUCTION MACH. DIV.
 Clyde Iron Wks., Inc.
 Crane Mobile—see Bay City Shovels, Inc.
DEMAG AKTIENGESellschaft
 Four Wheel Drive Auto Co., The
 Garwood Industries, Inc.
HARNISCHFEGGER CORP.
HIAB—SEE STANCO MFG. & SALES, INC.
HYDROCRANE—SEE BUCYRUS-ERIE CO.
 Hyster Co.
INTERNATIONAL HARVESTER EXPORT CO.
INTERNATIONAL SUPERIOR—SEE INTERNATIONAL HARVESTER EXPORT CO.
KOEHNING CO.
LE TOURNEAU-WESTINGHOUSE ERIE CO.
 Link Belt Speeder Corp.
LIMA — SEE BALDWIN-LIMA-HAMILTON CORP.
 Lorain—see Thew Shovel Co.
MANITOWOC ENG. CORP.
 Mannesmann Export G.m.b.H.
MARION POWER SHOVEL CO.
 Marion Engineering Co., Ltd.
 MotoCrane—see Thew Shovel Co.
 Northwest Eng. Co.
 Ohio Hoist & Mfg. Co.
 Pettibone Mulliken Corp.
 Quick Way Truck Shovel Co.
 Schield Bantam Co.
 Service Supply Corp.
 Smith & Sons (Rodley) Ltd., Thos.
STANCO MFG. & SALES, INC.
 Thew Shovel Co.
TRANSIT CRANE — SEE BUCYRUS-ERIE CO.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
 Uhren, Inc.
 Unit Crane & Shovel Corp.

CRUSHERS

See also Laboratory Equipment and Supplies

CONE

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Bath Iron Wks. Corp.
 Coeur d'Alene Hardware & Foundry Co.
 Fraser & Chalmers
 General Electric Co. Ltd., The
 Humboldt, Klockner - Humboldt-Deutz, A. G.
HYDROCRANE—SEE ALLIS CHALMERS MFG. CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deutz A. G.
 Lippmann Eng. Works
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NORDBERG MANUFACTURING CO.
 Pennsylvania Crusher Co.
 Smith Engineering Works
 Straub Mfg. Co., Inc.
SYMONS—SEE NORDBERG MANUFACTURING CO.

GYRATORY

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.

AMSCO—SEE AMERICAN BRAKE SHOE CO.

Bath Iron Wks. Corp.
 General Electric Co. of England, Ltd.
HADFIELD LTD.
 Humboldt, Klockner-Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Kue-ken—see Straub Mfg. Co., Inc.
 Klockner-Humboldt-Deutz A. G.
 Lippmann Engineering Works
MASSCO—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MFG. CO.
 Pennsylvania Crusher Co.
 Smith Engineering Works
 Straub Mfg. Co., Inc.
STURTEVANT MILL CO.
SUPERIOR—SEE ALLIS CHALMERS MFG. CO.
SYMONS—SEE NORDBERG MANUFACTURING CO.
TRAYLOR ENGR. & MFG. CO.

HAMMER AND IMPACT

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Athey Prod. Corp.
 Bath Iron Wks.
 Baxter, Ltd.
 Bradford-Breaker—see Penn. Crusher Co.
 British Jeffrey-Diamond Ltd.
 Combustion Engineering, Inc., Raymond Div.
 Crusher Eng. Div., Poor & Co.
 Diamond Iron Works Div., Goodman Mfg. Co.
 Eagle Crusher Co.
 Fraser & Chalmers
 General Electric Co. Ltd., The
 Gruender Crusher & Pulverizer Co.
 Hazemag of Germany—see Hazemag USA, Inc.
 Humboldt, Klockner-Humboldt-Deutz, A. G.
 International Combustion (Export) Ltd.
 Iowa Manufacturing Co.
 Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deutz A. G.
KNITTEL—SEE STEPHENS-ADAMSON MFG. CO.
 Krupp, Fried. Maschine und Stahbau Rheinhausen
 Lippmann Engineering Works
MUDHOG—SEE JEFFREY MANUFACTURING CO., THE MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NORDBERG MFG. CO.
 Pennsylvania Crusher Co.
 Pioneer Eng. Div., Poor & Co., Inc.
 Pettibone Mulliken Corp.
 Polysius G.m.b.H.
 Pulva Corp.
 PulvaSizer—see Pulva Corp.
PULVERIZER CO.—SEE ALLIS CHALMERS MFG. CO.
 Rogers Iron Works Co.
 Simplicity Engineering Co.
 Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
STURTEVANT MILL CO.
SYMONS—SEE NORDBERG MFG. CO.
THUNES MEK. VERSTED, A. S.
 Universal Engineering Corp.
 Universal—see Pettibone Mulliken Corp.
 Williams Crusher & Pulverizer Co.
 Wolf, Buckau R (Maschinenfabrik) A.G.

JAW

A-1—SEE ALLIS CHALMERS MFG. CO.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BALDWIN-LIMA-HAMILTON CORP.
 Bath Iron Wks. Corp.
 Baxter, Ltd., W. H.
 Bico, Inc.
 Birdsboro Steel Foundry & Machine Co.
 Broadbent, Robert & Son, Ltd.
 Crusher Eng. Div., Poor & Co.

Drives, Car

JOY MANUFACTURING CO.
Mayhew Supply Co.
MOBILE DRILLING INC.
PORTA-DRILL—SEE WINTER
WEISS CO., THE
Reich Bros. Mfg. Co.
Salem Tool Co.
Salzgitter Maschinen Aktiengesellschaft
Thor Power Tool Co.
TRACDRILL—SEE JOY MFG. CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.
WINTER WEISS CO., THE
Wood & Co. Ltd., Hugh

DIAMOND DRILLS

ACKER DRILL COMPANY, INC.
American Coldest Corp.
Atomic Eng. Corp.
BOYLES BROS. DRILLING CO.
BOYLES BROS. DRILLING CO., LTD. (CANADA)
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Damco—see Drilling Accessory & Mfg. Co., Inc.
DIAMOND DRILL CONTRACTING CO.
Drilling Accessory & Mfg. Co., Inc.
Du Jac Mfg. Co.
Failing Co., Geo. E.
General Electric Co., Carboly Dept.
Havlicek, J. L.
Holeycat—see Atomic Eng. Corp.
Hitchcock, Leo L.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
Koebel Diamond Tool Co.
Longyear Co., E. J.
McClintock Co., R. S.
Metal Carbides Corp.
Moab Drilling Co.
MOBILE DRILLING INC.
Monarch Equipment Co.
Morgardshammars Mek. Verkstads A.B.
Penn-drill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
Port-O-Pow—see Hitchcock Mfg. Co., Leo.
Porto Tool Co.
SPRAGUE & HENWOOD, INC.
Super Pioneer—see Diamond Drill Contracting Co.
TELLURIDE IRON WKS.
Tomco
Wheel Trusing Tool Co.
Wink Corp.

GASOLINE DRILLS AND HAMMERS

ACKER DRILL CO.
Allied Geophysics
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO, A. B. SWEDEN
Barco Manufacturing Co.
Carpo Mfg. Co.
CHICAGO PNEUMATIC TOOL CO.
General Equipment Co.
Hoesfeld Manufacturing Co.
PIONJAR—SEE STANCO MFG. & SALES, INC.
Porto Drill Co.
Powermite Drill & Tool Co.
STANCO MFG. & SALES, INC.
Svenska Motorbör AB, Stockholm-Solna, Sweden
SYNTRON CO.

JET PIERCING DRILLS

BUCYRUS ERIE CO.
Carpo Mfg. Co.
Linde Air Prod. Co.
Union Carbon & Carbide Corp., Linde Air Products Co., Div.

JUMBO AND BOOM ASSEMBLIES
See also Self Loading Transport
ATLAS COPCO, A. B. SWEDEN
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Drillard Co., Howard
GARDNER-DENVER CO.
Gismo—see Sanford Day Iron Wks.
HYDRO DRILL JIB—SEE JOY MANUFACTURING CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Landia Steel Co.
MAYO TUNNEL & MINE EQUIP. CO.
Minerals & Engr. Co., (Colo.)
Mobile Drilling Inc.

Rogers Iron Works Co.
Sanford Day Iron Wks.
Thor Power Tool Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.
WINTER WEISS CO., THE

PERCUSSION DRILLS

Drifters

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Bohler, Gebr. & Co. A.G.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Dagenhardt-Utsch K.G.
DEMAG AKTIENGESSELLSCHAFT
Flottmann G.m.b.H.
GARDNER-DENVER CO.
Hauhinco Maschinenfabrik
Hausberr, Rudolf & Son G.m.b.H.
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.
Schramm Inc.
SILVER STREAK—SEE JOY MFG. CO.
Thor Power Tool Co.
Turbo Maschinen A. G.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.
Worthington Corp.

SINKERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
DEMAG AKTIENGESSELLSCHAFT
Flottmann G.m.b.H.
GARDNER-DENVER CO.
Hausberr, Rudolf & Son G.m.b.H.
Hemacheidt, Hermann Maschinenfabrik
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.
Powermite Drill & Tool Co.
Schramm Inc.
SILVER STREAK—SEE JOY MFG. CO.
SPANG & CO.
Thor Power Tool Co.
Turbo-Maschinen A.G.
Westinghouse Air Brake Co., Le Roi Div.

SHOT DRILLS

ACKER DRILL COMPANY, INC.
Cardox Corp.
Consolidated Pneumatic Tool Co., Ltd.
Damco—see Drilling Accessory & Mfg. Co., Inc.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., George E.
Mayhew Supply Co.
MOBILE DRILLING, INC.
Penn-drill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
PORTA-DRILL—SEE WINTER WEISS CO., THE
Reich Bros. Mfg. Co., Inc.
Salzgitter Maschinen Aktiengesellschaft
SPRAGUE & HENWOOD, INC.
Westinghouse Air Brake Co. (Pa.)
WINTER-WEISS CO., THE

STOPERS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Bohler, Gebr. & Co. A. G.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Dagenhardt-Utsch K. G.
DEMAG AKTIENGESSELLSCHAFT
Firth Sterling, Inc.
Flottmann G.m.b.H.
GARDNER-DENVER CO.
Hauhinco Maschinenfabrik
Hausberr, Rudolf & Son G.m.b.H.
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.

Premag G.m.b.H.
SILVER STREAK — SEE JOY MFG. CO.
TELLURIDE IRON WKS.
Thor Power Tool Co.
Turbo-Maschinen A. G.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

ROTARY DRILLS

ACKER DRILL COMPANY, INC.
Allied Geophysics
Augsburg-Nurnberg A. G., Maschinenfabrik (M.A.N.)
Bohler, Gebr. & Co. A.G.
BUCYRUS-ERIE CO.
Cardox Corp.
CHICAGO PNEUMATIC TOOL CO.
Conrad-Stork
Consolidated Pneumatic Tool Co., Ltd.
Dagenhardt-Utsch A.G.
Damco—see Drilling Accessory Mfg. Co., Inc.
Drilling Accessory Mfg. Co., Inc.
Firth Sterling, Inc.
Flottmann-Werke G.m.b.H.
GARDNER-DENVER CO.
General Electric Co., Carboly Dept.
Hauhinco Maschinenfabrik
Hemacheidt, Hermann
Failing Co., Geo. E.
Hurricane—see Mayhew Supply Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.
Longyear Co., E. J.
Mayhew Supply Co.
Moab Drilling Co.
Mobile Drilling Inc.
Nott Core Drilling, Inc.
National Supply Co. (Pa.)
Pandril—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
PORTA-DRILL — SEE WINTER WEISS CO., THE
Port-O-Pow—see Hitchcock Mfg. Co., Leo.
Porto Tool Co.
Powermite Drill & Tool Co.
Premag G.m.b.H.
Reich Bros. Mfg. Co.
Rogers Iron Works Co.
Salzgitter Maschinen Aktiengesellschaft
Schramm Inc.
Star Expansion Pacific, Inc.
Thor Power Tool Co.
Varel Mfg. Co.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
WINTER WEISS CO., THE

TURBINE

Salzgitter Maschinen A.G.

WAGON DRILLS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
DEMAG AKTIENGESSELLSCHAFT
Drilling Accessory & Mfg. Co., Inc.
Firth Sterling, Inc.
GARDNER-DENVER CO.
Hausberr, Rudolf & Son G.m.b.H.
Holman Bros. (Canada) Ltd.
HOSSFELD MANUFACTURING CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
LE ROI DIV., WESTINGHOUSE AIR BRAKE CO.
Salzgitter Maschinen Aktiengesellschaft
Schramm Inc.
Thor Power Tool Co.
Westinghouse Air Brake Co., Le Roi Div.
Worthington Corp.

TRUCK, MOUNTED

ACKER DRILL CO., INC.
Atomic Eng. Corp.
BOYLES BROS. DRILLING CO. LTD., (CANADA)
Copco Mfg. Co.
Damco—see Drilling Accessory & Mfg. Co.
Drilling Accessory & Mfg. Co., Inc.
DRILLMASTER — SEE INGERSOLL-RAND CO.
Failing, Geo. E.
Four Wheel Drive Auto Co., The

GARDNER-DENVER CO.
Holeycat—see Atomic Eng. Corp.
INGERSOLL-RAND CO.
JOY MFG. CO.
Longyear Co., E. J.
Mayhew Supply Co.
McClintock Co., R. S.
Mobile Drilling Inc.
Minerals Eng. Co., (Colo.)
Mott Core Drilling Co.
National Supply Co. (Pa.)
PORTA-DRILL — SEE WINTER WEISS CO., THE
Powermite Drill & Tool Co.
Reich Bros. Mfg. Co.
Salzgitter Maschinen Aktiengesellschaft
Schramm, Inc.
STANCO MFG. & SALES CO.
Westinghouse Air Brake Co., Le Roi Div.
Westinghouse Air Brake Co. (Pa.)
WINTER WEISS CO.

DRIVES, GEAR

See Gears

DRIVES

See Also Shaft Mounted Drives; Gears; Open Gearing

CHAIN

AMERICAN BRACE SHOE CO.
AMER. MANGANESE STEEL DIV.
Bodinson Mfg. Co.
Chain Belt Co.
Conveyor Co., The
Diamond Chain Co., Inc.
Dodge Mfg. Corp.
Div.
B. F. Goodrich Co., Industrial Prod.
Hirsch Bros. Machy. Co.
Ideal—see National Supply Co., (Pa.)
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CO.
LINK-BELT CO.
Morse Chain Co.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Ogden Iron Works Co.
Rex—see Chain Belt Co.
Thiele, August G.m.b.H.
Yuba Mfg. Co.

FLATBELT

American Rubber Mfg. Co.
Bodinson Mfg. Co.
Continental Gin Co.
Conveyor Co., The
The Gates Rubber Co., The
Hazemag of Germany
Hirsch Bros. Machy. Co.
INTERNATIONAL B. F. GOOD-RICH
NATIONAL IRON CO.
Ogden Iron Works Co.
Quaker Pioneer Rubber Mills
U. S. Rubber Co.
U. S. Rubber Intl.
Western Gear Wks.
Yuba Mfg. Co.

V BELTS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Bodinson Mfg. Co.
Continental Gin Co.
Conveyor Co., The
Dodge Mfg. Co.
Gates Rubber Co., The
Goodrich Co., B. F., Industrial Prod. Div.
Hazemag of Germany
Hirsch Bros. Machy. Co.
INTERNATIONAL B. F. GOOD-RICH
KENNEDY-VAN SAUN MFG. & ENG. CO.
LINK-BELT CO.
MAGIC GRIP—SEE ALLIS-CHALMERS MFG. CO.
Mosbach Electric & Supply Co.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Ogden Iron Works Co.
Quaker Pioneer Rubber Mills
Reeves Pulley Co.
Taper-Lock—see Dodge Mfg. Co.
TEXROPE—SEE ALLIS-CHALMERS MFG. CO.
U. S. Rubber Co.
U. S. Rubber Intl.
Western Gear Wks.
Worthington Corp.
Yuba Mfg. Co.

DRYERS AND KILNS

See also Sintering Machines;
Coolers

ALLIS-CHALMERS MFG. CO. INDUSTRIES GROUP
American Locomotive Co.
BARBER-GREENE CO.
Bethlehem Steel Co.
Bird Machine Co.
Bodinson Mfg. Co.
BOTH CO., INC., THE
BOOTH CONCENTRATE DRYER
—SEE **BOOTH CO., INC., THE**
Carpc Mfg. Inc.
Carrier Conveyor Corp.
Centrifugal & Mechanical Industries, Inc.
Christian Engineers, J. D.
COLORADO IRON WORKS CO.
Combustion Engineering Inc., Raymond Div.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
DRAGO CORP.
ELECTRIC STEEL FOUNDRY CO.
General American Transportation Corp.
General Machinery Co.
GOULD & CO., GORDON I.
HACK ENGINEERING CO.
Hartweg, Walter
HARDING CO., INC.
Hazemag of Germany—see Hazemag USA, Inc.
Hevi Duty Electric Co.
Heyl & Patterson, Inc.
Hold-Flite—see Christian Engineers, J. D.
HOLLO-FLITE — SEE WESTERN PRECIPITATION CORP.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Iowa Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Loesche, Germany
Lowden—see Colorado Iron Works
MCLEANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
Nichols Engineering & Research Corp.
NORDBERG MFG. CO.
Ogden Iron Works Co.
PACIFIC FOUNDRY CO., LTD.
Parry Dryer—see Silver Engineering Co.
Pollock Co., The William B.
Polysius G.m.b.H.
Saracco Tank & Welding Co.
Silver Engineering Co.
SKINNER—SEE MINE & SMELTER SUPPLY CO.
SMITH & CO., F. L.
Standard Steel Corp.
STEARNS, ROGER MFG. CO.
Surface Combustion Corp.
TELLURIDE IRON WKS.
TRAYLOR ENG. & MFG. CO.
Universal Dredge Mfg. Co.
VULCAN IRON WORKS, PA.
Washington Machinery Co.
WESTERN PRECIPITATION CORP.
Yuba Mfg. Div., Yuba Consolidated Industries, Inc.

DUMPERS, MINE CAR

ALLISON STEEL MFG. CO.
ATLAS COPCO AB, SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
CARD IRON WORKS CO., THE
C. S.
Coeur d'Arle Hardware & Foundry Co.
Connellsville Mfg. & Mine Supply Co.
Differential Steel Car Co.
Gottwald, Leo
Getman Bros. Mfg. Divn., Inc.
Gregg Co., Ltd., The
Heyl & Patterson, Inc.
KAR-FLO—SEE LINK-BELT CO.
Kochring Co.
LAKE SHORE INC.
LINK-BELT CO.
McNally Pittsburgh Co.
MINERS FOUNDRY & MFG. CO.
Nolan Co., The
Ogden Iron Works Co.
Pacific Car & Foundry Co.
Pohlig, J., A.G.
Rogers Iron Wks.
TELLURIDE IRON WORKS
UNITED STATES STEEL EX-PORT CO.
Wellman Engineering Co.

DUST COLLECTION

EQUIPMENT

Aeroturn—see Koppers Co. Inc., Metal Prod. Div.
American Air Filter Co.
American Blower Div. of American Standard
BARBER-GREENE CO.
Buell Engineering Co., Inc.
Combustion Engineering Inc., Raymond Div.
COTTRELL — SEE WESTERN PRECIPITATION CORP.
DUALAIRE — SEE WESTERN PRECIPITATION CORP.
Ducon Co.
Dustube—see Wheelabrator Corp.
Fraser & Chalmers
General Electric Co. Ltd., The
Hazemag of Germany—see Hazemag USA, Inc.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Iowa Manufacturing Co.
Jonson March Corp.
JOY MFG. CO.
Klockner-Humboldt-Deutz, A. G.
Koppers Co. Inc., Metal Prod. Div.
Majac Inc.
Markely Dust Control System, Inc.
Martindale Electric Co.
MINE SAFETY APPLIANCES CO.
MULTICLONE—SEE WESTERN PRECIPITATION CORP.
National Filter Media Corp.
NOBLE — SEE NORTHERN BLOWER CO., THE
NORTHERN BLOWER CO., THE
Research Cottrell, Inc.
Saracco Tank & Welding Co.
Sly Mfg. Co., The W. W.
Spencer Turbine Co., The
Martindale Filterbar G.m.b.H.
STURTEVANT MILL CO.
Torit Manufacturing Co.
U. S. Hoffmann Machinery Corp.
WESTERN PRECIPITATION CORP.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co. Le Roi Div.
Westinghouse Electric Corp.
Wheelabrator Corp.

ELECTRICAL EQUIPMENT

See also Magnetic Equipment; Locomotives; Batteries; Chargers; Welding Equipment; Supplies and Services; Hoisting Equipment; Communications; Winches; Cable and Conduit; Testing and Control Equipment

CABLE AND CONDUIT

See Cable and Conduit

DIESEL GENERATOR SETS

Allis-Chalmers Mfg. Co., Buda Div.
Caterpillar Tractor Co.
General Electric Co. Apparatus Sales Div.
Westinghouse Elec. Corp.

INSTRUMENTS

See Testing and Control Equipment

LIGHT PLANTS

Allis-Chalmers Mfg. Co., Buda
American M.A.R.C.
American Locomotive Co.
Caterpillar Tractor Co.
Cummins Engine Co., Inc.
Dorman & Co., Ltd., W. H.
Electro-Motive Power—see General Motors Corp., Electro-Motive Div.
Fairbanks, Morse & Co.
General Electric Co., Apparatus Sales Div.
General Electric Co. of England, Ltd.

General Metals Corp., Enterprise Div.
General Motors Corp., Electro-Motive Div.
GM DIESEL—SEE GENERAL MOTORS OVERSEAS OPERATIONS
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGER CORP.
Hobart Bros. Co.
Hobart—see Motor Generator Corp.
Homelite Corp.
Ideal Electric & Mfg. Co.
International Gen'l Elec. Co.
JOY-LITE—SEE JOY MFG. CO.
JOY MANUFACTURING CO.
Katolite Corp.
Koeberling Southern Co.
Kohler Co.
Lister-Blackstone, Inc.
Lynco Powerhouse—see Lynn Engr. & Supply Co.
Lynn Eng. Co.
Minneapolis-Moline Co.
Motor Generator Corp.
NORDBERG MFG. CO.
Onan & Sons, Inc., D. W.
Power-Lite—see Lynn Eng. Co.
Ready Power Co.
Schoonmaker Co., Inc., P. G.
Sheppard Co., R. H.
STEARNS-ROGER MFG. CO.
Thor Power Tool Co.
Westinghouse Electric Corp.
Witte Engine Works, Oil Well Supply Div.

MOTOR MAINTENANCE EQUIP.

Martindale Electric Co.

MOTORS, GENERATORS, AND CONVERTERS

Allis Co., The Louis
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA ELECTRIC, INC.
ASEA, SWEDEN
Brown Boverie & Cie. A.G.
Caterpillar Tractor Co.
Connecticut Telephone & Electric Corp.
DELCO—SEE GENERAL MOTORS OVERSEAS OPERATIONS
Eaton Manufacturing Co.
Electric Machinery Mfg. Co.
Fairbanks, Morse & Co.
General Dynamics Corp., Electro Dynamic Div.
General Electric Co., Apparatus Sales Div.
General Electric Co., International
General Electric Co. of England, Ltd.
General Motors Corp., Electro-Motive Div.
General Metals Corp., Enterprise Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGER CORP.
Homelite Div., Texttron, Inc.
Howard Electric Motors Co.
Ideal Electric & Mfg. Co.
Int'l General Elec. Co.
Kato Engineering Co.
Lancashire Dynamo & Crypto Ltd.
Lima Electric Motor Co., The
Lincoln Electric Co.
Linc-weld—see Lincoln Elec. Co.
Linde Air Products Co.
Lynn Eng. & Supply Co.
Master Electric Co., The
Mather & Platt Ltd.
Metropolitan-Vickers Electrical Co., Ltd.
Miehle-Goss-Dexter, Inc., Star-Kimble Motor Div.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Mosebach Electric & Supply
B. & M.—see Robbins & Myers, Inc.
Reliance Electric & Engineering Co.
Robbins & Myers, Inc.
Schoonmaker Co., Inc., P. G.
Siemens & Halske A.G.
Syring Electric Motors, Inc.
Syringer—see U.S. Electrical Motors, Inc.
Thor Power Tool Co.

Electrical Equipment

Tri-Clad—see International General Electric Co.
Uniclosed—see U.S. Electrical Motors, Inc.
U.S. Electrical Motors, Inc.
Varidrive—see U.S. Electrical Motors, Inc.
Wagner Electric Corp.
Waukesha Motor Co.
Welco—see Wesche Electric Co.
Wesche Electric Co.
WESTINGHOUSE AIR BRAKE CO., LE ROI DIV.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp.
Worthington Corp.

PACKAGE SUBSTATION

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
General Electric Co., Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
International General Electric Co.
I-T-E Circuit Breaker Co.
Kulman Electric Co.
Leonard Electric Co.
National Supply Co. (Pa.)
Schoonmaker Co., Inc., P. G.
Standard Transformer Co., The
Westinghouse Electric Corp.

SOLENOIDS

Trombetta Solenoids Corp.

TRANSFORMERS AND RECTIFIERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA ELECTRIC, INC.
ASEA, SWEDEN
Carpc Mfg. Inc.
Cutler-Hammer, Inc.
Edwards Co., Inc.
Essex Wire Corp., Parante Wire and Cable Div.
General Electric Co. Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
Hillman Co. Inc., C. Kirk
International General Electric Co.
I-T-E Circuit Breaker Co.
Kulman Electric Co.
Mosebach Electric & Supply Co.
Reliance Electric & Engineering Co.
Schoonmaker Co., Inc., P. G.
Standard Transformer Co.
SYNTRON CO.
Texas Instruments, Inc., (Dallas)
Wagner Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp.
Weston Electrical Instrument Corp.

MISCELLANEOUS (CONDENSERS, RESISTORS, POTENTIOMETERS, ETC.)

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ASEA, SWEDEN
Cutler-Hammer, Inc.
Eaton Mfg. Co., Dynamatic Divn.
EC&M Frequency Relay Control—see Electric Controller & Mfg. Co., The
EC&M Valmitor—see Electric Controller & Mfg. Co., The
Edwards Co., Inc.
Electric Controller & Mfg. Co., The
General Electric Co. Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
Hillman Co. Inc., C. Kirk
Ideal Industries, Inc.
International General Electric Co.
JOY MANUFACTURING CO.
Martindale Electric Co.
Metropolitan-Vickers Electrical Co. Ltd.
Micro-Switch Div. of Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indus. Div.
Mosebach Elec. & Supply Co.
National Mine Service Co.
Ohio Carbon Co., The
Ohiohm—see Ohio Carbon Co., The
Rawson Electrical Instrument Co.
REGULEX—SEE ALLIS CHALMERS MFG. CO.
Reverse Electric Manufacturing Co.
Rowan Controller Co.
RUPTAIR—SEE ALLIS CHALMERS MFG. CO.
Siemens & Halske A.G.
Signal Engr. & Mfg. Co.
Superior Carbon Prod., Inc.
Texas Instruments, Inc. (Dallas)
Trombetta Solenoid Corp.
Ward Leonard Electric Co.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Engine Exhaust Conditioners, Underground

Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Weston Electrical Instrument Corp.

ENGINE EXHAUST CONDITIONERS, UNDERGROUND

Hunslet Engine Co. Ltd., The
OCM Catalytic Exhaust, OCM
Diesel Exhaust, OXY-Muffler
Exhaust — see Oxy-Catalyst,
Inc.
Oxy-Catalyst, Inc.
Ruth Co., The

ENGINEERING SERVICES

See Plant Design and Construction; Exploration Services; Consulting Mining Engineers

ENGINEERING SUPPLIES & DRAFTING EQUIPMENT

See also Surveying Instruments
Bauch & Lomb Optical Co.
Bergner & Sons, Inc.
Booklime, Inc.
Dietzgen Co., Eugene
General Aniline & Film Corp.,
Osald & Div.
Geo-Optics Co., Inc.
Keuffel & Esser Co.
Lefax
Lufkin Rule Co.
Pack Mfg. Co.
Post Co., Frederick
Rocky Mountain Instrument Co.
Roto-lite Co.
White Instrument Co., David
WILD HEERBRUGG INSTRUMENTS, INC.

ENGINES

See also Electrical Equipment

DIESEL AND SEMI-DIESEL

Alco Products, Inc.
ALLIS-CHALMERS MFG. CO.,
CONST. MACH. DIV.
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Allis-Chalmers Mfg. Co., Buda Co.,
The
American Locomotive Co.
Baldwin-Lima-Hamilton Corp., Ed-
dytown Div.
Blackburn International Corp.
Caterpillar Tractor Co.
CHICAGO PNEUMATIC TOOL
CO.
Continental Motors Corp.
Cooper-Bessemer Corp., The
Cummins Engine Co., Inc.
Diesel Engine Corp., Klockner-
Humboldt-Deutz A. G.
Dorman & Co. Ltd., W. H.
Enterprise Eng. & Mach. Co.
Fairbanks, Morse & Co.
General Metals Corp., Enterprise
Div.
General Metals Corp., Enterprise
Engine & Machinery Co.—a
Subsidiary
General Motors Corp., Detroit Diesel
Engine Division
General Motors Corp.—Electro-mo-
tive Div.
GENERAL MOTORS OVERSEAS
OPERATIONS
Hall-Scott Motors, Inc.
HARNISCHFEGGER CORP.
Hercules Motors Corp.
INGERSOLL-RAND CO.
International Harvester Co.
INTERNATIONAL HARVESTER
EXPORT CO.
Klockner-Humboldt-Deutz, A. G.
Lister-Blackstone, Inc.
Mannesmann Export G.m.b.H.
Minneapolis-Moline Co.
MIRRELEES, BICKERTON & DAY,
LTD.
NORDBERG MFG. CO.
Onan & Sons, Inc., D.W.
P & H—SEE HARNISCHFEGGER
CORP.
Roder-Blackburn Intl. Corp.
RUSTON & HORNBY LTD.
Schoonmaker Co., Inc., P. G.
Sheppard Co., R. H.
Waukesha Motor Co.

WHITE MOTOR CO., THE
Witte Eng. Wks., Oil Well Supply
Div.
U. S. STEEL CO.
Worthington Corp.

GAS

ALLIS-CHALMERS MFG. CO.,
CONST. MACH. DIV.
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Allis-Chalmers Mfg. Co., Buda Div.
Caterpillar Tractor Co.
CHICAGO PNEUMATIC TOOL
CO.
Continental Motor Corp.
Cooper-Bessemer Corp.
Cummins Engine Co., Inc.
Enterprise Eng. & Mach. Co.
Fairbanks, Morse & Co.
General Metals Corp., Enterprise
Div.
Hall-Scott Motors, Inc.
Hercules Motors Corp.
INGERSOLL-RAND CO.
International Harvester Co.
INTERNATIONAL HARVESTER
EXPORT CO.
Klockner-Humboldt-Deutz, A. G.
Kohler Co.
Minneapolis-Moline Co.
NORDBERG MFG. CO.
Onan & Sons, Inc., D. W.
Waukesha Motor Co.
Westinghouse Air Brake Co., Le
Roi Div.
Westinghouse Air Brake Co. (Pa.)
WHITE MOTOR CO., THE
Wisconsin Motor Corp.
Witte Eng. Wks. Oil Well Supply
U. S. STEEL CORP.
Worthington Corp.

GASOLINE

Allis-Chalmers Mfg. Co., Const.
Mach. Div.
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Allis-Chalmers Mfg. Co., Buda Co.
Div.
Briggs & Stratton Corp.
Continental Motors Corp.
Fairbanks, Morse & Co.
G. M. C., Allison Div.
GENERAL MOTORS OVERSEAS
OPERATIONS
HALL-SCOTT MOTORS, INC.
Hercules Motors Corp.
International Harvester Co.
INTERNATIONAL HARVESTER
EXPORT CO.
Koehring Southern Co.
Kohler Co.
Le Roi Div., Westinghouse Air
Brake Co.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Minneapolis-Moline Co.
National Supply Co., The, Engine
Div.
Onan & Sons, Inc., D. W.
Ruston & Hornsby Ltd.
Turbo Jet—see G. M. C., Allison
Div.
Turbo Prop—see G. M. C., Allison
Div.
Waukesha Motor Co.
Westinghouse Air Brake Co., Le Roi
Div.
Westinghouse Air Brake Co. (Pa.)
Wisconsin Motor Corp.
Witte Engine Works, Oil Well Sup-
ply Div., U. S. Steel Corp.

EXCAVATORS

See also Tractors and Attach-
ments; Dredges and Dredge
Buckets; Loaders; Monitors;
Scrapers; Backhoes
ALLIS-CHALMERS MFG. CO.,
CONSTRUCTION EQUIP-
MENT DIVISION
American Brake Shoe Co.
American Hoist & Derrick Co.
BALDWIN-LIMA-HAMILTON
CORP.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCHYRUS-ERIE CO.
CLARK EQUIP. CO., CONSTRUC-
TION MACH. DIV.
ELECTRIC STEEL FOUNDRY CO.
FASTBACK—SEE ELECTRIC
STEEL FOUNDRY CO.
Onan & Sons, Inc., D.W.
Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
Hystaway—see Hyster Co.
Hyster Co.
Koehring Co.
LIMA—SEE BALDWIN-LIMA-
HAMILTON CORP.

Link Belt Speeder Corp.
LORAIN—SEE THEW SHOVEL
CO.
MANITOWOC ENGR. CO.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Pence & Co., Inc., Earl H.
Pettibone Mulliken Corp.
Quick-Way Truck Shovel Co.
Schield Bantam Co.
THEW SHOVEL CO.
Tractohoe—see Tractomotive Corp.
Tractomotive Corp.
Unit Crane & Shovel Corp.
Westinghouse Air Brake Co., Le
Roi Div.
"Bucket Wheel Excavators"
Fried Krupp
Orenstein-Koppel und Lubecker
Maschinenbau A.G.

CABLEWAYS

Slackline
CLARK EQUIP. CO., CONSTRUC-
TION MACH. DIV.
SAUERMAN BROS., INC.
Washington Iron Works

CABLEWAYS

Tautline
CLARK EQUIP. CO., CONSTRUC-
TION MACH. DIV.
SAUERMAN BROS., INC.

DRAGLINES

Diesel
American Hoist & Derrick Co.,
BALDWIN-LIMA-HAMILTON
CORP.
Bantam—see Schield Bantam Co.
Bay City Shovel Inc.
BUCHYRUS-ERIE CO., CONST.
MACH. DIV.
DEMAG AKTIENGESELLSCHAFT
Fa. Ten Pas & Co.
Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
Koehring Co.
LIMA—SEE BALDWIN-LIMA-
HAMILTON CORP.
Link Belt Speeder Corp.
LORAIN—SEE THEW SHOVEL
CO.
MANITOWOC ENGR. CO.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
Quick-Way Truck Shovel Co.
Schield Bantam Co.
THEW SHOVEL CO.
Unit Crane & Shovel Corp.
Washington Iron Works

Electric

American Hoist & Derrick Co.,
Crosby-Laughlin Div.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCHYRUS-ERIE CO.
DEMAG AKTIENGESELLSCHAFT
HARNISCHFEGGER CORP.
Koehring Co.
Link Belt Speeder Corp.
MANITOWOC ENGR. CO.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
Schield Bantam Co.
THEW SHOVEL CO.
Unit Crane & Shovel Corp.

SCRAPERS, SELF-PROPELLED

ALLIS-CHALMERS MANUFAC-
TURING CO., CONST.
MACH. DIV.
BALDWIN - LIMA - HAMILTON
CORP.
Beaumont—see Internl Combustion
(Export) Ltd.
Caterpillar Tractor Co.
CARRYALL—SEE LETOUR-
NEAU-WESTINGHOUSE CO.
CLARK EQUIPMENT CO.,
CONST. MACH. DIV.
GENERAL MOTORS CORP.,
EUCALID DIVISION
GENERAL MOTORS OVERSEAS
OPERATIONS
Gismo—see Sanford Day Iron
Works, Inc.
Gottwald, Leo
International Combustion (Export)
CO.
Landis Steel Co.
LETOURNEAU-WESTINGHOUSE
CO.
Link Belt Speeder Corp.
Roder Iron Works Co.
Sanford Day Iron Wks.
TOURNAPULL—SEE LE TOUR-
NEAU-WESTINGHOUSE CO.

Westinghouse Air Brake Co. (Pa.)
WESTINGHOUSE CO., LE TOUR-
NEAU
Woodbridge Mfg. Div., Continental
Copper & Steel Industries, Inc.

SHAFT MUCKERS—see Shaft

Sinking

SHOVELS, POWER Diesel

American Hoist & Derrick Co.,
BALDWIN-LIMA-HAMILTON
CORP., LIMA-HAMILTON
DIV.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCHYRUS-ERIE CO.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO.,
CONST. MACH. DIV.
Clark Equipment Co.
Clyde Iron Works, Inc.
DEMAG AKTIENGESELLSCHAFT
Eimco Corp., The
ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
HARNISCHFEGGER CORP.
Koehring Co.
LIMA—SEE BALDWIN-LIMA-
HAMILTON CORP.
Link-Belt Speeder Corp.
Lorain—see Thew Shovel Co.
MANITOWOC ENGINEERING
CORP.
MARION POWER SHOVEL CO.
Menck & Hambrook G.m.b.H.
MICHIGAN—SEE CLARK EQUIP-
MENT CO.
Newton Chambers & Co., Ltd.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGGER
CORP.
Quick-Way Truck Shovel Co.
Ruston-Bucyrus Ltd.
Schield Bantam Co.
Smith & Sons (Rodley) Ltd., Thos.
Thew Shovel Co.
Traxcautor—see Caterpillar Trac-
tor Co.
Unit Crane & Shovel Corp.
Wesserhutte Otto Wolff G.m.b.H.

Electric

American Hoist & Derrick Co.,
Crosby-Laughlin Div.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCHYRUS-ERIE CO.
DEMAG AKTIENGESELLSCHAFT
Eimco Corp., The
ELECTRIC STEEL FOUNDRY CO.
Goodman Mfg. Co.
HARNISCHFEGGER CORP.
Koehring Co.
Link-Belt Speeder Corp.
Lorain—see Thew Shovel Co.
MANITOWOC ENGINEERING
CORP.
MARION POWER SHOVEL CO.
Menck & Hambrook G.m.b.H.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGGER
CORP.
Salzgitter Maschinen Aktiengesell-
schaft
Schield Bantam Co.
THEW SHOVEL CO.
Unit Crane & Shovel Corp.

PARTS AND ATTACHMENTS

ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.
American Hoist & Derrick Co.,
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
BALDWIN-LIMA-HAMILTON
CORP.
BUCHYRUS-ERIE CO.
Caterpillar Tractor Co.
CLARK EQUIP. CO., CONSTRUC-
TION MACH. DIV.
COLORADO FUEL & IRON CORP.
Dolmar Maschinen Fabrik
Eimco Corp., The
ELECTRIC STEEL FOUNDRY
CO.
Gar Wood Industries, Inc.
HADFIELD'S LTD.
HARNISCHFEGGER CORP.
Hensler Equip. Co.
Koehring Co.
Link-Belt Speeder Corp.
MANITOWOC ENGINEERING
CORP.
MARION POWER SHOVEL CO.
Owen Buckler Co.
PACIFIC—SEE ALLOY STEEL &
METALS CO.
Page Engineering Co.
Pence & Co., Inc., Earl H.

Pettibone Mulliken Corp.
Quick-Way Truck Shovel Co.
R-Mor—see Vulcan Foundry Co.
Taylor Wharton Iron & Steel Co.
Thew Shovel Co.
Unit Crane & Shovel Corp.
Vulcan Foundry Co.
Wesserbütte Otto Wolff G.m.b.H.
Westinghouse Air Brake Co., Ind.
Products Div.
Westinghouse Air Brake Co., Le
Roi Div.

EXPLORATION

EQUIPMENT

See also Drills, Rock

Geochemical Equipment

Analytical Measurements, Inc.
Drullard Co., Howard
International Geophysics, Inc.
Menlo Research Lab.
Mobile Drilling, Inc.
Research Inc.

Geophysical Equipment

Allied Geophysics
Alpine Laboratories, Ltd.
Analytical Measurements, Inc.
Askania-Werke A.G.
Detectron Corp.
Eberline Inst. Div.—Reynolds Elect.
& Eng. Co.
Electro-Technical Labs.
Engineers Syndicate, Ltd.
Fisher Research Laboratory, Inc.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Geophysical Specialties Co.
Hycan Aerial Surveys, Inc.
International Geophysics, Inc.
JOY MFG. CO.
La Roe Instruments, Inc.
Longyear Co., E. J.
M-Scope—see Fisher Research Lab-
oratory, Inc.
Menlo Research Lab.
Mobile Drilling, Inc.
Nucleonic Corp. of America
Precision Radiation Instruments,
Inc.
Radiac Co., Inc., The
Rawson Electrical Instrument Co.
Research Inc.
Salem Tool Co.
Texas Instrument, Inc. (Dallas)
Texas Instruments, Inc., Industrial
Instrumentation Div. (Houston)
Ultra-Violet Products, Inc.
United Geophysical Corp.
Universal Atomic, Div. of Univ.
Transistor Prod. Corp.
Uranium Enterprises
VARIAN ASSOCIATES
Victoreen Instrument Co.
Western Radiation Lab.
Westinghouse Electric Corp.
Whites' Electronics

ULTRA VIOLET LIGHTS

Mineralight—see Ultra Violet Prod.,
Inc.
Ultra Violet Prod., Inc.

EXPLORATION SERVICES

Aircraft

Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
Autair, Ltd.
BELL HELICOPTER CO.
Canadian Aero Service Ltd.
Engineers Syndicate, Ltd.
International Geophysics, Inc.
Porto Tool Co.
Rick Helicopters
Tate Mine Contracting & Devel. Co.
World Wide Aerial Surveys (Aust.)
Pty. Ltd.

DRILLING

Churn

DIAMOND DRILL CONTRACT-
ING CO.
International Geophysics, Inc.
Koebel Diamond Tool Co.
Longyear Co., E. J.
McDonald, T. J.
Minerals Engineering Co., (Colo.)
Moab Drilling Co.
Mott Core Drilling Co.
Pennsylvania Drilling Co.
Salzgitter Maschinen Aktiengesell-
schaft
SPANG & CO.
SPRAGUE & HENWOOD, INC.

World Mining Consultants, Inc.
Yuba Manufacturing Co.

Diamond

Allied Geophysics
BOYLES BROS. DRILLING CO.
BOYLES BROS. DRILLING CO.
LTD. (CANADA)
DIAMOND DRILL CONTRACT-
ING CO.
Du Jac Mfg. Corp.
Havlicek, J. L.
Hitchcock Mfg. Co., Leo
International Geophysics, Inc.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
Koebel Diamond Tool Co.
LIVINGSTON & WILSON EX-
PLORATION & DRILLING
CO.

Longyear Co., E. J.
McClintock Co., R. S.
McDonald, T. J. (Colo.)
Minerals Engineering Co.
MOAB DRILLING CO.
Mobile Drilling, Inc.
Mott Core Drilling Co.
Pennsylvania Drilling Co.
SHAMROCK DRILLING ENTER-
PRISES

Smit & Co., Inc., Anton
SPRAGUE & HENWOOD, INC.
St. Clair, John Q.
United Geophysical Corp.
World Mining Consultants, Inc.

Rotary

Allied Geophysics
BOYLES BROS. DRILLING CO.,
LTD., (CANADA)
Cardox Corp.
DEMAG AKTIENGESSELLSCHAFT
Exploration Drilling Co.
Geodynamics, Inc.
International Geophysics, Inc.
JOY MANUFACTURING CO.
Longyear Co., E. J.
Minerals Eng. Co., (Colo.)
Mobile Drilling, Inc.
Mott Core Drilling Co.
Pennsylvania Drilling Co.
Reich Bros. Mfg. Co.
St. Clair, John Q.
Salzgitter Maschinen Aktiengesell-
schaft
United Geophysical Corp.
World Mining Consultants, Inc.

SURVEYING

Aerial

Abrams Aerial Survey Corp.
Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
Canadian Aero Service Ltd.
Chapman and Wood
ELLIOTT, D. H.
Fairchild Aerial Surveys, Inc.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Geoprosessional Services, Inc.
Hunting Associates, Ltd.
Hycan Aerial Surveys, Inc.
International Geophysics, Inc.
Laylander, Philip A.
Longyear Co., E. J.
Lundberg Explorations, Ltd.
Menlo Research Lab.
Minerals Exploration Research
Corp.
Mott & Sons, Inc., B. H.
Permo Exploration Co.
Precision Radiation Instruments,
Inc.
Radiac Company, Inc., The
Research, Inc.
Sloan, DBA & Associates
St. Clair, John Q.
STILL & STILL
Tracerlab, Inc.
Uranium Enterprises
Uranium Research & Devel. Corp.
World Wide Aerial Surveys (Aust.)
Pty. Ltd.

Geochemical

Alderman, Sidney S., Jr.
Drullard Co., Howard
Geodynamics, Inc.
International Geophysics, Inc.

Longyear Co., E. J.
Menlo Research Lab.
Minerals Exploration Research
Corp.
Ore Research & Laboratories
Radiac Company, Inc., The
Research, Inc.
STILL & STILL
Wisser & Cox

Geological

Abrams Aerial Survey Corp.
Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
Alderman, Sidney S., Jr.
Bartell, A. O.
BOYLES BROS. DRILLING CO.
Canadian Aero Service Ltd.
CHAPMAN WOOD, AND GRIS-
WOLD

Davis & Davis
Engineers Syndicate Ltd.
Fairchild Aerial Surveys, Inc.
Fisher Research Laboratory, Inc.
Geodynamics, Inc.
Geo-Engineering
Geo-Optic Co., Inc.
Geoprosessional Services, Inc.
Hulin, Carlton D.
Hycan Aerial Surveys, Inc.
International Geophysics, Inc.
Keegle, C. P.
Laylander, Philip A.
Longyear Co., E. J.
M-Scope—see Fisher Research Lab-
oratory, Inc.
Menlo Research Lab.
Minerals Exploration Research
Corp.
Moab Drilling Co.
Mobile Drilling, Inc.
Murphy, F. M.
Ore Research & Laboratories
Peale, Rogers
Permo Exploration Co.
Precision Radiation Instruments,
Inc.

Radiac Co Inc., The
Ray Drilling Co., Inc.
Schroter & Lockwood
Shedwick, Jr., Wm. J.
St. Clair, John Q.
Stephenson, Robert C.
STILL & STILL
United Geophysical Corp.
Uranium Enterprises
Uranium Exploration
Uranium Research & Devel. Co.
WISSER & COX
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.)
Pty. Ltd.

Geophysical

Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
Alderman, Sidney S., Jr.
Allied Geophysics
Alpine Laboratories, Ltd.
Canadian Aero Service, Ltd.
Engineers Syndicate, Ltd.
Fairchild Aerial Surveys, Inc.
Fisher Research Laboratory, Inc.
Geodynamics, Inc.
Geo-Optic Co., Inc.
Geophysical Services, Inc.
Hunting Associates, Ltd.
Hycan Aerial Surveys, Inc.
International Geophysics, Inc.
Longyear Co., E. J.
Lundberg Explorations, Ltd.
M-Scope—see Fisher Research Lab-
oratory, Inc.
Menlo Research Lab.
Minerals Exploration Research
Corp.
Mining & Geophysical Services, Ltd.
Moab Drilling Co.
Mobile Drilling, Inc.
Peale, Rogers
Precision Radiation Instruments,
Inc.
Radiac Co., Inc., The
Research, Inc.
Seismograph Service Corp.

SHAMROCK DRILLING ENTER-
PRISES
STILL & STILL
Texas Instruments, Inc. (Dallas)
Tracerlab, Inc.
United Geophysical Corp.
Uranium Enterprises
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.)
Pty. Ltd.

EXPLOSIVES

See Blasting Supplies

FANS

See Ventilation Equipment and
Supplies

FASTENERS, BELT

ABCs Scale Division, McDowell Co.,
Inc.
Alligator—see Flexible Steel Lacing
Co.
American Rubber Mfg. Co.
Armstrong-Bray & Co.
Clippert Beltlacing Co.
Continental Gin Co.
Crescent Belt Fastener Co., Inc.
Flexco—see Flexible Steel Lacing
Co.
Flexible Steel Lacing Co.
General Electric Co. Ltd., The
GOODALL RUBBER CO.
National Mine Service Co.
Plateagrip—see Armstrong-Bray &
Co.
Steelgrip—see Armstrong-Bray &
Co.
Talcott, Inc., W. O. & M. W.
Three Point Belt Lacing, Inc.

FEEDERS

ORE

Apron

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
BARBER-GREENE CO., INC.
Baxter Ltd., W. H.
Bodinson Mfg. Co.
Bonded Scale & Mach. Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
DEMAG AKTIENGESSELLSCHAFT
DENVER EQUIPMENT CO.
Diamond Iron Works Div., Good-
man Mfg. Co.
Eickhoff, Gebr. Maschinenfabrik u.
Eisenwerkerei G.m.b.H.
ELECTRIC STEEL FOUNDRY
CO.
Fraser & Chalmers
General Electric Co., Ltd., The
HACK ENGINEERING CO.
HADFIELD LTD.
HARDINGE CO., INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-
Deutz, A. G.
Iowa Mfg. Co.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
McLANAHAN & STONE CO.
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
MORSE BROS. MACHINERY CO.
NATIONAL IRON CO.
NORDBERG MFG. CO.
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor &
Co., Inc.
Ret—see Chain Belt Co.
Richardson Scale Co.
Rogers Iron Works Co.
ROSS SCREEN & FEEDER CO.
Smith Engineering Works
SOUTHWESTERN ENG. CO.
STEPHENS-ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Tisco—see Taylor-Wharton Iron &
Steel Co.
TRAYLOR ENG. & MFG. CO.
Universal—see Pettibone Mulliken
Corp.
Universal Dredge Mfg. Co.

**Manufacturer's Complete Names and Ad-
dresses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

Filter Media

Universal Engineering Corp.
Washington Machinery Co.
Wilmot Engineering Co.

Belt

ABCs Scale Division, McDowell Co., Inc.
American Rubber Mfg. Co.
B. I. F. Industries, Inc.
BARBER GREENE CO.
Bear—see American Rubber Mfg. Co.

Bodinson Mfg. Co.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
Crackerjack—see American Rubber Mfg. Co.

DEMAG AKTIENGESellschaft
DENVER EQUIPMENT CO.
Flexible Steel Lacing Co.
Fraser & Chalmers
HACK ENG. CO.

HARDINGE CO., INC.
HEWITT-ROBBINS, INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.

INTERNATIONAL B. F. GOOD-RICH

Iowa Mfg. Co.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.

Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
Magnetic Eng. & Mfg. Co.
McDowell Co., Inc.

MCCLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
MINES FOUNDRY & MFG. CO.
Morse Bros. Machinery Co.

Ogden Iron Works Co.
Pettibone Mulliken Corp.
Rex—see Chain Belt Co.
Richardson Scale Co.

Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
STRAUB MFG. CO., INC.
TELLURIDE IRON WORKS CO.
THERMOID CO.

Universal Dredge Mfg. Co.
Universal Road Mach.
Washington Machinery Co.

Chain

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.

Bodinson Mfg. Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The

DEMAG AKTIENGESellschaft
ELECTRIC STEEL FOUNDRY CO.
HACK ENG. CO.
HARDINGE CO., INC.

Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Lippmann Engineering Works

Ogden Iron Works Co.
Rex—see Chain Belt Co.
ROSS SCREEN & FEEDER CO.
Smith Engineering Works

STEPHENS-ADAMSON MFG. CO.
TELLURIDE IRON WORKS, CO.
Thiele, August G.m.b.H.
Universal Dredge Mfg. Co.

Constant Weight

ABCs Scale Division, McDowell Co., Inc.
Conveyor Co., The
HARDINGE CO., INC.
Jeffrey Manufacturing Co.

KENNEDY-VAN SAUN MFG. & ENG. CORP.
International Combustion, Ltd.
LINK-BELT CO.

MERRICK SCALE MFG. CO.
POIDOMETER—SEE SCHAFFER POIDOMETER CO.
Richardson Scale Co.

SCHAFFER POIDOMETER CO.
Simplicity Engineering Co.
SYNTRON CO.
Washington Mach. Co.

WATTROL—SEE JEFFREY MANUFACTURING CO., THE

RECIPROCATING

GOULD & CO., GORDON I. LINK-BELT CO.

DISC

DEISTER CONCENTRATOR CO.
LINK-BELT CO.

Pan

Bodinson Mfg. Co.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Cleveland Vibrator Co., The

Continental Gin Co.
Conveyor Co., The
Diamond Iron Works Div., Goodman Mfg. Co.
ELECTRIC STEEL FOUNDRY CO.

HACK ENGINEERING CO.
HADFIELD LTD.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.

Iowa Mfg. Co.
Jeffrey Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.

LINK-BELT CO.
Lippmann Engineering Works
MCCLANAHAN & STONE
McNally Pittsburgh Co.

MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Ogden Iron Works Co.
Os-A-Veyor—see Simplicity Eng. Co.

Pioneer Engineering, Div. Poor & Co., Inc.
Rex—see Chain Belt Co.
Simplicity Engineering Co.

Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
STRAUB MFG. CO., INC.
Taylor-Wharton Iron & Steel Co.

TELLURIDE IRON WORKS CO.
Tisco—see Taylor-Wharton Iron & Steel Co.
TRAYLOR ENG. AND MFG. CO.
Universal Dredge Mfg. Co.

Universal Engineering Corp.
Washington Machinery Co.

REVOLVING

CONCENCO—SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
LINK-BELT CO.

Table

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Carpo Mfg. Inc.
Chain Belt Co.

CONCENCO—SEE DEISTER CONCENTRATOR CO.
Continental Gin Co.
DEISTER CONCENTRATOR CO.

General Electric Co. Ltd., The
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.

Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Pulva Corp.
Rex—see Chain Belt Co.

TRAYLOR ENG. & MFG. CO.
Clarkson Co., The
Com-Bin—see Pulva Corp.

DENVER EQUIPMENT CO.
EQUIPMENT ENGINEERS INC.
Feederator—see Fischer & Porter Co.

Fischer & Porter Co.
Galigher Co., The
Geary—see Galigher Co., The

Geary Junior—see Galigher Co., The
Gibson, W. W.
Humboldt, Klockner-Humboldt-Deutz, A. G.

INFILCO, INC.
JEFFREY MANUFACTURING CO.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.

MASSCO-ADAMS—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER CO.
Minerais et Metaux
Morse Bros. Machinery Co.

Wedag, A.G.
WESTERN MACHY. CO.
Bin-Dictator Co., The
Carrier Conveyor Corp.

VIBRATING

LINK-BELT CO.
Morgordshammars Mek. Verkstads A.B.
Simplicity Eng. Co.

SYNTRON CO.

FILTER MEDIA

Aloxite—see Carborundum Co., The
American Air Filter Co. Inc.
Burwell—see Minerals Eng. Co.
Celite—see Johns-Manville

Cleveland Wire Cloth & Mfg. Co., The
Carborundum Co., The
Dicalite Div., Great Lakes Carbon Corp.

DORR-OLIVER INC.
Eimco Corp., The
Feon—see Filtration Engineers Div.
Filtration Engineers, Div. American Machine & Metals, Inc.

Filter Fabrics, Inc.
Johns-Manville Sales Corp.
Ludlow-Saylor Wire Cloth Co.
National Filter Media Corp.

NFM—see National Filter Media Corp.
Norton Company
Pendleton Woolen Mills
Peterson Filters & Eng. Co.

FILTERS

AIR

ATD Mufflers—see Allied Witan Co., Inc.
Allied Witan Co., Inc.
American Air Filter Co., Inc.

ATLAS COPCO, A. B., SWEDEN
BEMIS BROS. BAG CO.
CHICAGO PNEUMATIC TOOL CO.

Condensifilter—see Hankison Corp.
Coppus Engineering Corp.
DriAir—see New Jersey Meter Co.

Duron Co.
GARDNER DENVER CO.
Hankison Corp.
Hazemag of Germany

Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion (Export) Ltd.
JOHNSON MARCH CORP.

KENNEDY-VAN SAUN MFG. & ENG. CORP.
MINE SAFETY APPLIANCES CO.
New Jersey Meter Co.

Saracco Tank & Welding Co.
Staplex Co., The
Thor Power Tool Co.
ULTRA-AIRE—SEE MINE SAFETY APPLIANCES CO.

Watts Regulator Company
WESTERN PRECIPITATION CORP.
Westinghouse Air Brake Co., Ind. Products Div.

Westinghouse Electric Corp., Sturtevant Div.
Wheelabrator Corp.
Winslow Engineering & Mfg. Co.

CONCENTRATE

AMERICAN—SEE DORR-OLIVER INC.
Bee-Tee—see Galigher Co., The
BEMIS BROS. BAG CO.

Bird Machine Co.
Buck & Associates, Carl
BURT—SEE MINE & SMELTER SUPPLY CO.

Carpo Mfg. Inc.
DENVER EQUIPMENT CO.
DORR-OLIVER INC.
DORR—SEE DORR-OLIVER, INC.

Eimco Corp., The
Feine—see Filtration Engineers, Div.
Filtration Engineers, Div.—American Machine & Metals, Inc.

Galigher Co., The
General American Transportation Corp.
HARDINGE CO., INC.

Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
INFILCO, INC.

International Combustion Ltd.
KELLY—SEE DORR-OLIVER, INC.
MINE & SMELTER SUPPLY CO.
MORSE BROS. MACHINERY CO.

OLIVER—SEE DORR-OLIVER, INC.
Peterson Filters & Engineering Co.
Saracco Tank & Welding Co.
SWEETLAND—SEE DORR-OLIVER, INC.

OIL

DORR-OLIVER, INC.
Filpro—see U. S. Hoffman Machy. Co.

GARDNER-DENVER CO.
INFILCO, INC.
Roder Blackburn International Corp.
Saracco Tank & Welding Co.
Schoonmaker Co. Inc., F. G.
Tamping Bag Co., The
Thor Power Tool Co.
U. S. Hoffman Machinery Corp.
Winslow-Weld—see Winslow Eng. & Mfg. Co.
Winslow & Mfg. Engineering Co.

FIRE BRICKS

See Also Refractories
BABCOCK & WILCOX CO., THE
Carborundum Co., The
Johns-Manville Sales Corp.
Kaiser Aluminum & Chem. Corp.
Mexico Refractories Co.
Robinson Clay Prod. Co., The
Utah Fire Clay Co.

FIRST AID SUPPLIES

See Safety Equipment

FLOTATION MACHINES

Agitair—see Galigher Co., The
Amag-Hilpert-Pegnitzhutte A.G.
BOOTH CO., INC.
FAGERGREN & STEFFENSEN
—SEE WESTERN MACHINERY CO.

Fraser & Chalmers
Galigher Co., The
Humboldt, Klockner-Humboldt-Deutz, A. G.

INFILCO, INC.
JETAIR—SEE MORSE BROS., MACHINERY CO.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.

Krupp, Fried. Maschinen und Stahlbau Rheinhausen
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Minemet—see Minerais et Metaux

Minerais et Metaux
MORSE BROS. MACHINERY CO.
NATIONAL TANK & PIPE CO.
Santa Fe Tank Div., Fluor Products Co.

STEARNS ROGER MFG. CO.
U. S. Hoffman Mach. Corp.
WEMCO-FAGERGREN—SEE WESTERN MACH. CO.
WESTERN MACHINERY CO.
Westinghouse Electric Corp., Sturtevant Div.

FLOTATION REAGENTS

See Reagents and Chemicals

FRAMERS

See Saws, Power

FRICTION MATERIAL

AMERICAN BRAKE SHOE CO.
Gatke Corp.
Johns-Manville Sales Corp.
Thermoid Co.
Tool Steel Gear & Pinion Co.
Velvetouch Ceramic—see Wellman Co., The S.K.
Wagner Electric Corp.
Wellman Co., S.K.

FURNACES

See Pyrometallurgical Equipment

FUSE

See Blasting Equipment

GATES

See Bins, Chutes and Accessories

GAUGES

Air Reduction Sales Co.
Aldon Co.
Beckman Instruments, Inc.
Bristol Co., The
Foxboro Co., The
General Electric Co., International
Lufkin Rule Co.
Lunkenheimer Co., The
Matheson Co., Inc.
Minneapolis-Honeywell Regulator Co.
Norwood Controls Unit
Weston Electrical Instrument Corp.

GEAR MOTORS

See Motors

GEARS

See also Speed Changers; Open Gearing; Drives; Shaft Mounted Drives
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
BROWN, INC., DAVID
Brown Industries, David
Christian Engineers, J. D.
Cleveland Worm & Gear Co., The
Coeur d'Alene Hardware & Foundry Co.
COLUMBIA STEEL CASTING CO., INC.
Conveyor Co., The
DEMAG AKTIENGESellschaft
Dodge Mfg. Corp.
Falk Corp., The
Farrel-Birmingham Co., Inc.
Federal Motor Truck Co.—Div. of Napco Industries, Inc.
Gatke Corp.
General Electric Co., International
HEWITT-ROBBINS, INC.
Jeffrey Manufacturing Co.
LINK-BELT CO.
Napco Industries Inc.
Ohio Gear Co.
Philadelphia Gear Works, Inc.
Salzgitter Maschinen Aktiengesellschaft
Schoonmaker Co., Inc., P. G.
STEARNS-ROGER MFG. CO., THE
STEPHENS ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
Tool Steel Gear & Pinion Co., The
Universal Gear Works, Inc.
Vulcan Iron Works, (Pa.)
Walker Bros. (Wigan) Ltd.
Western Foundry Co.
Western Gear Corp. (Calif.)
Western Gear Corp. (Wash.)
Western Gear Corp.—Pacific Gear Plant
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Worthington Corp.
Yuba Manufacturing Co.

GEIGER & SCINTILLATION COUNTERS

See also Exploration Equipment

Allied Geophysics
Alpine Laboratories, Ltd.
Atomic Engineering Corp.
Babbel—see Uranium Eng. Co.
Braun-Knecht-Heimann Co.
Carco Mfg. Inc.
COLORADO ASSAYING CO.
Custom—see Precision Radiation Instruments
De Luxe—see Precision Radiation Instruments
Detron Corp.
Eberline Inst. Div., Reynolds Elect. & Eng. Co.
Electro-Technical Labs.
El-Tronics, Inc.
Engineers Syndicate, Ltd.
Fisher Research Lab, Inc.
Gammocat—see Atomic Engineering Corp.
GENERAL ELECTRIC CO., INTERNATIONAL
Hysan Aerial Survey, Inc.
Junction Bit & Tool Co.
La Roe Instruments, Inc.
Menlo Research Lab.
Mt. Sopris Inst. Corp.
Nuclear-Chicago Corp.
Nucleonic Corp. of America
Philips Electronics, Inc., Instruments Div.

Pick Laboratories
Precision Radiation Instruments, Inc.
Professional—see Precision Radiation Inst.
Radiac Co., Inc., The
Snooper—see Precision Radiation Inst.
Snyder's Mine & Chemical Lab.
Special—see Precision Radiation Inst.
Standard—see Precision Radiation Inst.
Technical Associates
Tracerlab, Inc.
Universal Atomics
Uranium Engr. Co.
Uranium Enterprises
Ultra Violet Prod., Inc.
Victoreen Instrument Co.
Western Radiation Lab.
White's Electronics

GENERATORS

See Electrical Equipment

GEOPHYSICAL SURVEYS

See Exploration Services

GIANTS

See Monitors

GRADERS

ADAMS—SEE LE TOURNEAU-WESTINGHOUSE CO.
ALLIS-CHALMERS MANUFACTURING CO., CONST. MACHY. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AUSTIN-WESTERN—SEE BALDWIN-LIMA-HAMILTON CORP.
Caterpillar Tractor Co.
Exolon Company, The
Haisz Mfg. Co., Inc.
Huber Warco Co.
LE TOURNEAU-WESTINGHOUSE CO.
Pettibone Mulliken Corp.
Speedgrader—see Pettibone Mulliken Corp.
Yuba Consolidated Industries, Inc.

GRINDERS

See Sharpeners, Rock Bit

GRINDING EQUIPMENT

BALL MILLS
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
BABCOCK & WILCOX CO.
BALLPEB—SEE ALLIS-CHALMERS MFG. CO.
Coeur d'Alene Hardware & Foundry Co.
COMPEB—SEE ALLIS-CHALMERS MFG. CO.
DENVER EQUIPMENT CO.
DRAVO CORP.
EIMCO CORP., THE
Esch-Verke, K. G.
Foster Wheeler Corp.
Fraser & Chalmers Eng. Wks.
Galigher Co.
Krupp, Fried. Maschinen und Stahlbau Rheinhausen
Gibson, W. W.
HARDINGE CO., INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion, Ltd.
International Engr., Inc.

KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
LAKE SHORE, INC.
LIVE ROLLER MILLS MFG. CO.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
MORSE BROS. MACHINERY CO.
NORDBERG MFG. CO.
RIB-CONE—SEE STRAUB MFG. CO., INC.
SMITH & CO., F. L.
STEARNS-ROGER MFG. CO.
Straub Mfg. Co., Inc.
Thunes Mek. Verkatet, A. S.
TRAYLOR ENG. & MFG. CO.
Union Iron Works

BALLS

ACF Industries, Inc., American Car & Foundry Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.
American Forge Co.
BABCOCK & WILCOX CO., THE
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
C F & I—SEE COLORADO FUEL & IRON CORP., THE
Calumet & Hecla, Inc., Calumet Div.
Coeur d'Alene Hardware & Foundry Co.
COLORADO FUEL & IRON CORP., THE
CONCAVEY—SEE ALLIS-CHALMERS MFG. CO.
Firth Sterling Inc.
Foster Wheeler Corp.
General Motors Corp., New Department Divan.
HADFIELD LTD.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE, LTD.
International Combustion Ltd.
KENNAMETAL, INC.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Ni Hard—see Calumet & Hecla, Inc., Calumet Div.
SHEFFIELD DIV., ARMCO STEEL CORP.
S K F Industries Inc.
U. S. STEEL CORP., COLUMBIA-GENEVA DIV.
USS—SEE U. S. STEEL CORP.
UNITED STATES STEEL EXPORT CO.
Western Foundry Co.

PEBBLE MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DENVER EQUIPMENT CO.
DRAVO CORP.
EIMCO CORP., THE
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE, LTD.
Klockner-Humboldt-Deutz, A. G.
International Combustion, Ltd.
International Engr., Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MANUFACTURING CO.
Saracco Tank & Welding Co.
SMITH & CO., F. L.

Grinding Equipment

STEARNS-ROGER MFG. CO.
Straub Mfg. Co., Inc.
Thunes Mek. Verkatet, A. S.
TRAYLOR ENG. & MFG. CO.
U. S. STEEL CORP.

ROD MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
BETHLEHEM PACIFIC COAST STEEL CORP.
COLORADO FUEL & IRON CORP.
DENVER EQUIPMENT CO.
DRAVO CORP.
EIMCO CORP., THE
General Electric Co., Ltd., The
Gibson, W. W.
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE, LTD.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
LIVE ROLLER MILLS MFG. CO.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
MORSE BROS. MACHINERY CO.
NORDBERG MFG. CO.
STEARNS-ROGER MFG. CO.
Thunes Mek. Verkatet, A. S.
TRAYLOR ENG. & MFG. CO.

RODS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Export Corp.
C F & I—SEE COLORADO FUEL & IRON CORP., THE
COLORADO FUEL & IRON CORP.
HADFIELD LTD.
HARDINGE CO., INC.
KENNAMETAL, INC.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Knapp & Bates, Ltd.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Saracco Tank & Welding Co.
SHEFFIELD DIV., ARMCO STEEL CORP.
U. S. STEEL CORP., COLUMBIA-GENEVA DIV.
United States Steel Export Co.
Youngstown Sheet & Tube Co., The

TUBE MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DRAVO CORP.
EIMCO CORP., THE
General Electric Co., Ltd., The
HARDINGE CO., INC.
HEAD WRIGHTSON, STOCKTON FORGE, LTD.
Humboldt, Klockner-Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
LAKE SHORE, INC.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
NORDBERG MFG. CO.
Saracco Tank & Welding Co.
SMITH & CO., F. L.
Straub Mfg. Co., Inc.
Thunes Mek. Verkatet, A. S.
TRAYLOR ENG. & MFG. CO.

LINERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BABCOCK & WILCOX CO., THE
Calumet & Hecla, Inc., Calumet Div.
Coeur d'Alene Hardware & Foundry Co.
COLUMBIA STEEL CASTING CO., INC.
DENVER EQUIPMENT CO.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Grizzlies

Gatke Corp.
Georgia Iron Works
MADFIELD LTD.
HARDING CO. INC.
HEAD WRIGHTSON, STOCKTON
FORGE LTD.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.
Knapp & Bates, Ltd.
MARCY-SEE MINE & SMELTER
SUPPLY CO., THE
MCLANAHAN & STONE CORP.
MINE & SMELTER SUPPLY CO.
MINERS FOUNDRY & MFG. CO.
NATIONAL MALLEABLE &
STEEL CASTING CO.
Ni-Hard-see Calumet & Hecla, Inc.
Calumet Div.
Sanford-Day Iron Works Inc.
SMITH & CO., F. L.
Straub Mfg. Co., Inc.
Taylor-Wharton Iron & Steel Co.
TRAYLOR ENG. & MFG. CO.
USS-SEE U.S. STEEL CORP.
UNITED STATES STEEL EXPORT
CO.
U. S. STEEL CORP., COLUMBIA-
GENEVA DIV.
Washington Iron Works
Western Foundry Co.

PULVERIZERS

Majac, Inc.

GRIZZLIES

See Screens, Grizzlies and
Accessories

GROUTING

See also Concreting Equipment

EQUIPMENT

Air Placement Equip. Co.
Air Placo-see Air Placement
Equip. Co.
CEMENT GUN CO.
CHICAGO PNEUMATIC TOOL CO.
Cementation Co. Ltd., The
DIAMOND DRILL CONTRACT-
ING CO.
DRAVO CORP.
Grout-or Blast-see Air Placement
Equip. Co.
Gunite-see Air Placement Equip
Co.
INTERNATIONAL B. F. GOOD-
RICH
Koehring Co.
LONGYEAR CO., E. J.
MAYO TUNNEL & MINE EQUIP-
MENT MOBILE DRILLING,
INC.
MORSE BROS. MACHINERY CO.
Pendrill-see Pennsylvania Drilling
Co.
Pennsylvania Drilling Co.
SPRAGUE & HENWOOD, INC.
Thor Power Tool Co.
Torkret G.m.b.H.

SERVICES

Cementation Co. Ltd., The
DIAMOND DRILL CONTR. CO.
McKenzie & Whittle Contractors
Minerals Engr. Co.
MOBILE DRILLING INC.

HARD FACING

See Welding Equipment
and Supplies

HATS

See Safety Equipment

HAULAGE UNITS, OFF-RAIL

See also Truck and Trailers,
Self Loading Transport

ALLIS-CHALMERS MFG. CO.,
CONSTRUCTION MACHY.
DIV.
Autocar-see The White Motor Co.,
Autocar Trucks Div.
DART TRUCK CO.
Easton Car & Construction Co.
EUCLID DIVISION, GENERAL
MOTORS CORP.
Federal Motor Truck Co.
Four Wheel Drive Auto Co., The

Fruehauf-see Fruehauf Trailer Co.
Fruehauf Trailer Co.
Galion Allstate Body Co.
GENERAL MOTORS CORP.,
EUCLID DIV.
GENERAL MOTORS OVERSEAS
OPERATIONS
GETMAN BROTHERS
GETMAN SHUTTLE CARS-SEE
GETMAN BROS.
Gismo-see Sanford Day Iron
Works, Inc.
Goodman Mfg. Co.
Heil Co., The
Howe Scale Co.
INTERNATIONAL HARVESTER
CO.
Jeffrey Mfg. Co., The
JOY MANUFACTURING TRUCK
CO.
Koehring Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE
CO.
Napco Industries, Inc.
Sanford-Day Iron Works, Inc.
SCOOT-CRETE-SEE GETMAN
BROS. MFG. DIV., INC.
TOURNAHOPPER-SEE LE
TOURNEAU-WESTING-
HOUSE CO.
TOURNAPOULL-SEE LE TOUR-
NEAU-WESTINGHOUSE CO.
TOURNAROCKER-SEE LE
TOURNEAU-WESTINGHOUSE
CO.
Westinghouse Air Brake Co., Le
Roi Div.
White Motor Co., Autocar, Trucks
Div.
Woodbridge Mfg. Div., Continental
Copper & Steel Industries, Inc.

HEADFRAMES

STEEL

ALLISON STEEL MFG. CO.
Connellsville Mfg. & Mine Supply
Co.
DEMAG AKTIENGESSELLSCHAFT
HACK ENG. CO.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
Humboldt, Klockner-Humboldt-
Deutz, A. G.
LAKE SHORE, INC.
MAYO TUNNEL & MINE EQUIP.
NATL. IRON CO.
Ogden Iron Works Co.
Silent Glow Oil Burner Corp.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Washington Iron Wks.

TIMBER

Koppers Co., Inc.

HEATERS

AIR

American Air Filters Co., Inc.
Carrier Corp.
Cutler-Hammer, Inc.
DRAVO CORP.
Foster Wheeler Corp.
General Electric Co., Apparatus
Sales Div.
GENERAL ELECTRIC CO., IN-
TERNATIONAL
GRAYBAR ELECTRIC CO., INC.
Grinnell Co., Inc.
International Combustion Ltd.
Klockner-Humboldt-Deutz, A. G.
Loesche, Germany
Mosebach Electric & Supply Co.
Saracco Tank & Welding Co.
Silent Glow Oil Burner Corp.
Surface Combustion Corp.
Thermolier-see Grinnell Co., Inc.
USCO-see International Combustion
Ltd.
Vulcan Electric Co.
Watlow Elec. Mfg. Co.
WESTINGHOUSE ELECTRIC
INTERNATIONAL CO.
Westinghouse Electric Corp., Stur-
tevant Div.

SPACE

American Air Filter Co., Inc.
American Blower Corp.
Carrier Corp.
Cutler-Hammer, Inc.
DRAVO CORP.
General Electric Co., Apparatus
Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
Iron Fireman Mfg. Co.
Mosebach Elec. & Supply Co.
Saracco Tank & Welding Co.
Silent Glow Oil Burner Corp.

Surface Combustion Corp.
U. S. Rubber Co.
Watlow Electric Mfg. Co.
Westinghouse Electric Corp.,
Sturtevant Div.
WESTINGHOUSE ELECTRIC
INTERNATIONAL CO.

HOISTING CABLE

See Rope, Wire

HOIST

COMMUNICATIONS

See Communications

HOIST CONTROLS and SAFETY EQUIPMENT

Bullard Co., E. D.
LILLY-SEE LOGAN ENGR. CO.
LOGAN ENGR. CO.
SIMPLEX-SEE LOGAN ENGR.
CO.

HOISTING

EQUIPMENT

See also Chain Hoists; Rope,
Wire

AUTOMATIC SKIP LOADING DEVICES

ASEA, SWEDEN
CONNELLVILLE MFG. & MINE
SUPPLY CO.
DEMAG AKTIENGESSELLSCHAFT
Hirsch Bros. Mfg. Co.
LINK-BELT CO.
Ogden Iron Works Co.

FRICTION HOISTS

American Hoist & Derrick Co.
ASEA ELECTRIC INC.
ASEA, SWEDEN
BLACK'S MINING EQUIPMENT,
LTD.
Clyde Iron Works, Inc.
CONNELLVILLE MFG. & MINE
SUPPLY CO.
Duff-Norton Co.
Eisenhutte Prinz Rudolph, A.G.
MAYO TUNNEL & MINE EQUIP-
MENT
Washington Iron Works

MINE SHAFT HOISTS Drum

ASEA, SWEDEN
Rodinson Mfg. Co.
Clyde Iron Wks., Inc.
Coeur d'Alene Hardware & Foundry
Co.
CONNELLVILLE MFG. & MINE
SUPPLY CO.
DEMAG AKTIENGESSELLSCHAFT
Eisenhutte Prinz Rudolph, A.G.
Electric Controller & Mfg. Co.
Fraser & Chalmers Eng. Wks.
GARDNER-DENVER CO.
General Electric Co. Ltd., The
Gregg Co., Ltd.
Hirsch Bros., Machinery Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Kema (Kohn-Ehrenfelder Maschin-
enbau-Anstalt)
LAKE SHORE, INC.
NORDBERG MFG. CO.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Shepard Niles Crane & Hoist Corp.
STEARNS ROGER MFG. CO.
Superior-Lidgerwood-Mundy Corp.
TELLURIDE IRON WKS.
VULCAN-DENVER-SEE VUL-
CAN IRON WORKS
VULCAN IRON WORKS
Washington Iron Wks.
Western Gear Wks.
Yuba Consolidated Industries, Inc.

Keepe

ASEA
Eisenhutte Prinz Rudolph, A.G.

SCRAPER HOISTS (slushers) Portable

American Chain & Cable Co., Inc.,
Wright Hoist Div.

American Hoist & Derrick Co.
ATLAS COPCO PACIFIC, INC.
ATLAS COPCO, A. B., SWEDEN
Brownie-see Sanford Day Iron
Works, Inc.
Cecalt S. A.-See Griphoist, Inc.
CHICAGO PNEUMATIC TOOL CO.
Clyde Iron Wks.
Consolidated Pneumatic Tool Co.,
Ltd.

Dusterloh, G. Fabrikfur Bergwerks-
bedarf G.m.b.H.
GARDNER-DENVER CO.
GRIPHOIST, INC.
HARNISCHFEGGER CORP.
Hasenclever (Maschinenfabrik) A.G.
Holman Bros. (Canada) Ltd.
Hopkinson & Co., Ltd., Austin
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
LEDEEN MFG. CO.
Lug-All Co., The
Mixermobile Mfg. Inc.
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.
Princeton Griphoist, Inc.
Round Chain Co's.
Sanford Day Iron Wks.
Scopmobile-see Mixermobile Mfg.
Inc.
Shepard Niles Crane & Hoist Corp.
Uhrden, Inc.
VULCAN-DENVER-VULCAN
IRON WORKS, DENVER,
COLO.
Vulcan Iron Works (Pa.)

Stationary

American Chain & Cable Co., Inc.,
Wright Hoist Div.
American Hoist & Derrick Co., Inc.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Beebe Bros.
Clyde Iron Wks., Inc.
Eisenhutte Prinz Rudolph, A.G.
Eisenwerke Mulheim Meiderich,
A.G.
Gar Wood Industries, Inc.
Gregg Co., Ltd.
HARNISCHFEGGER CORP.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
LAKE SHORE INC.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.
Round Chain Co's.
Sanford Day Iron Wks.
SAUERMAN BROS., INC.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG. CO.
Uhrden, Inc.
VULCAN-DENVER-SEE VUL-
CAN IRON WORKS, DEN-
VER, COLO.
VULCAN IRON WORKS (DEN-
VER)
Washington Iron Works

SKIPS AND CAGES

ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
AMSCO-SEE AMERICAN BRAKE
SHOE
ASEA, SWEDEN
ATLAS CAR & MFG. CO., THE
Rodinson Mfg. Co.
CARD IRON WORKS CO., THE
C. S.
Clyde Iron Works, Inc.
CONNELLVILLE MFG. & MINE
SUPPLY CO.
DEMAG AKTIENGESSELLSCHAFT
Easton Car & Construction Co.
Gregg Co., Ltd.
HACK ENGINEERING CO.
HEAD WRIGHTSON, STOCKTON
FORGE, LTD.
Hirsch Bros. Machinery Co.
JETO-SKIP-SEE LAKE SHORE,
INC.
LAKE SHORE, INC.
MAYO TUNNEL & MINE EQUIP.
MINERS FOUNDRY & MFG. CO.
NATIONAL IRON CO.
Nolan Co., The
NORDBERG MFG. CO.
Ogden Iron Works Co.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Sanford-Day Iron Works Inc.
STEARNS ROGER MFG. CO.
TELLURIDE IRON WORKS CO.
Universal Dredge Mfg. Co.
VULCAN-DENVER-SEE VUL-
CAN IRON WORKS, DEN-
VER, COLORADO

VULCAN IRON WORKS (COLO.)
Vulcan Iron Works (Pa.)
Wellman Engineering Co., The

HOSE

Air Reduction Sales Co.
American Rubber Mfg. Co.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Band-it Co.
Bear—see American Rubber Mfg. Co.
Boston Woven Hose & Rubber Co.
Buck & Associates, Carl
Carlyle Rubber Co., Inc.
Carmac—see Carl Buck & Associates
Champ—see Hose Accessories Co., Champ Industries Div.
CHICAGO PNEUMATIC TOOL CO.
Condor—see Raybestos-Manhattan, Inc.
Clearstream-Garden—see Yardley Plastics Co.
Crackerjack—see American Rubber Mfg. Co.
Drullard Co., Howard
Eimco Corp., The
Gates Rubber Co., The
Goodall Rubber Co.
Goodrich Co., B. F., Industrial Prod. Div.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
Hose Accessories Co., Champ Industries Div.
Industrial Air Prod. Co.
INTERNATIONAL B. F. GOOD-RICH
Lee Rubber & Tire Corp., Republic Rubber Div.
Porter Co., H. K., Quaker Rubber Div.
Quaker Pioneer Rubber Mills
Raybestos—Manhattan, Inc.
Straloff Inc.
Stewart-Warner Corp.
Tamping Bag Co., Div., Pickard Industries, Inc.
THERMOID CO.
Thor Power Tool Co.
United States Rubber Co.
U. S. Rubber Inc.
Yardley Plastics Co.
Yosemite—see American Rubber Mfg. Co.

HYDROSEPARATORS

See Thickeners and Tanks;
Classifiers

IDLERS

See Conveyor Equipment

INCREASERS, SPEED

See Speed Changers

INSTRUMENTS

See Engineering Supplies; Surveying Instruments; Testing and Control Equipment

ION EXCHANGE RESINS

See Reagents and Chemicals

JIGS

See Concentrating Equipment

JIM CROWS

See Track and Accessories

JUMBOS

See Drills, Rack

KILNS

See Dryers and Kilns; Coolers

LABORATORIES AND ASSAYERS

Agence Miniere & Maritime S. A.
Arizona Assay Office
ARIZONA TESTING LABORATORIES
Bennetts Chemical Laboratory, Inc.
BLOCH & DEASON
BOOTH CO., INC.
Braun-Knecht-Heimann Co.
Carpco Mfg. Inc.
Central Scientific Co. of Calif.
CHAPMAN AND WOOD
Charlton Laboratories
COLORADO ASSAYING CO., THE
Custom Assay Office
Deason & Nichols
DEGGENDORFER, T. G.
DENVER EQUIPMENT CO.
DICKINSON LABORATORIES, INC.
El Paso Testing Laboratories
Engineers Syndicate, Ltd.
Galigher Co., The
GOODALL BROS.
Hanks, Inc., Abbott A.
HAWLEY & HAWLEY
Imperial Chemical Industries, Ltd.
Junction Bit & Tool Co.
KENNEDY—VAN SAUN MFG. & ENG. CORP.
Knapp & Bates, Ltd.
Ledoux & Co.
Lerch Bros., Inc.
Mack, Peter
Menlo Research Lab.
Minerals Engineering Co. (Calif.)
Minerals Engineering Co. (Colo.)
Minerals Laboratory
Mobile Drilling, Inc.
ORE RESEARCH & LABORATORIES
Osborne Laboratories, Inc., Raymond G.
Philips Electronics, Inc., Instruments Div.
REED ENGINEERING
Research Inc.
Root & Simpson, Inc.
SMITH-EMERY CO.
Snell Inc., Foster D.
SOUTHERN SPECTROGRAPHIC LABORATORY
Stearns Magnetic, Inc.
Stowell & Co., W. H.
STURTEVANT MILL CO.
Twining Laboratories, The
Udy, Marvin J.
WOOD ASSAYING CO., HENRY E.

LABORATORY EQUIPMENT AND SUPPLIES

See also Reagents and Chemicals

Laboratory and Testing Machines

Agitair—see Galigher Co., The
Ainsworth & Sons, Inc., Wm.
Ainsworth Balances—see Ainsworth & Sons, Inc.
BALDWIN-LIMA-HAMILTON CORP.
Bausch & Lomb Optical Co.
Beckman Instruments, Inc., Scientific Instruments Div.
Bico, Inc.
BOOTH CO., INC.
Braun-Knecht-Heimann Co.
Carpco Mfg., Inc.
Central Scientific Co. of Calif.
DENVER FIRE CLAY CO.
Detection Corp.
DFC—SEE DENVER FIRE CLAY CO., THE
ENGINEERS SYNDICATE, LTD.
GALIGHER CO.
GENERAL ELECTRIC CO., INTERNATIONAL
General Mach. Co.
HARDINGE CO., INC.
HUMPHREYS INVESTMENT CO.
International Combustion Ltd.
International Eng. Inc.
Kentrone—see Torsion Balance Co., The
Knapp & Bates, Ltd.
Ledoux & Co.
Lerlab Supply Co.
MacBeth Inst. Corp.
MASSCO—SEE MINE & SMELTER SUPPLY CO.

Menlo Research Laboratory
MINE & SMELTER SUPPLY CO.
Minerals et Metaux
Morgordshammars Mek. Verkstads A.B.
MORSE BROS. MACHINERY CO.
Philips Electronics, Inc., Instruments Div.
Photovolt Corp.
Porter Co., Inc., H. K., The, W-S Fittings Div.
Precision Radiation Inst., Inc.
Pulvis Corp.
Rawson Electrical Inst. Co.
RO-TAP—SEE TYLER CO., THE
W.S.
Sepor Microsplitter Supply
Staplex Co., The
Stearns Magnetic, Inc.
STURTEVANT MILL CO.
Thompson Balance Co.
Torsion Balance Co., The
TY-LAB—SEE TYLER CO., THE
W. S.
TYLER CO., THE W. S.
Ultra Violet Prod., Inc.
Universal Vibrating Screen Co.
Volland & Sons, Inc.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.

MISCELLANEOUS LABORATORY SUPPLIES

Allied Chem. & Dye Corp., General Chem. Div.
Alpine Laboratories, Ltd.
Baker & Adamson—see Allied Chemical & Dye Corp., General Chem. Div.
Bausch & Lomb Optical Co.
Bico, Inc.
Braun-Knecht-Heimann Co.
Carpco Mfg., Inc.
Carrier Corp.
Central Scientific Co. of Calif.
Combustion Engineering Inc., Raymond Div.
DFC—SEE DENVER FIRE CLAY CO.
DENVER EQUIPMENT CO.
DENVER FIRE CLAY CO.
Engineers Syndicate, Ltd.
Flacher & Porter Co.
Hevi Duty Electric Co.
Hoffman Bros. Drilling Co.
Industrial Physics & Electronics Co.
International Combustion, Ltd.
Knapp & Bates, Ltd.
Lerlab Supply Company
LINE ROLLER MILLS MFG. CO.
Menlo Research Lab.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Nucleonic Corp. of America
Rapid Magnetic Machines, Ltd.
Snyder's Mine & Chemical Lab
STURTEVANT MILL CO.
Thompson Balance Co.
Ultra-Violet Products

LACING, BELT

See Fasteners, Belt

LAMPS, MINER

See Safety Equipment

LIGHT PLANTS

See Electrical Equipment

LIGHTS

See Safety Equipment

LINERS

See Grinding Equipment

LOADERS, FRONT

END AND OVERHEAD

See also Tractors and Attachments, Self Loading Transport

Locomotives

CRAWLER

Aggricat—see Joost Mfg. Co.
ALLIS-CHALMERS MANUFACTURING CO., CONST. MACH. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
American Tractor Equipment Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A. B., SWEDEN
AUSTIN-WESTERN—SEE BALDWIN-LIMA-HAMILTON CORP.
BALDWIN-LIMA-HAMILTON CORP.
BARBER-GREENE CO.
Caterpillar Tractor Co.
DROTT MFG. CO.
Eimco Corp., The
Goodman Mfg. Co.
HARNISCHFEGER CORP.
Hough Co., The, Frank G.
INTERNATIONAL HARVESTER EXPORT CO.
Joost Mfg. Co.
JOY MANUFACTURING CO.
Lodover—see Service Supply Co.
MARION POWER SHOVEL CO.
Merton Engineering Co., Ltd.
Minneapolis-Moline Co.
Oliver Corp., The
Payloader—see Hough Co., The Frank G.
Pence & Co., Inc., Earl H.
Salzgitter Maschinen Aktiengesellschaft
Sanford Day Iron Wks.
Service Supply Corp.
Skid-Shovel—see Drott Mfg. Corp.
Tractomotive Corp.
Tracto-Shovel—see Tractomotive Corp.
Traxcavator—see Caterpillar Tractor Co.
VICKERS-ARMSTRONGS (TRACTORS) LTD.

RAIL (Mucking Machines)

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A. B., SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
BALDWIN-LIMA-HAMILTON CORP.
Eimco Corp., The
Salzgitter Maschinen Aktiengesellschaft

RUBBER TIRED

ADAMS TRAVELOADER—SEE LE TOURNEAU-WESTINGHOUSE CO.
American Tractor Equipment Corp.
AUSTIN-WESTERN—SEE BALDWIN-LIMA-HAMILTON CORP.
BARBER-GREENE CO.
EUCLID DIVISION, GENERAL MOTORS CORP.
HOUGH—SEE INTERNATIONAL HARVESTER EXPORT CO.
Hough Co., Frank G.
INTERNATIONAL HARVESTER EXPORT CO.
Jaeger Machine Co., The
Merton Engineering Co., Ltd.
LE TOURNEAU-WESTINGHOUSE CO.
Minneapolis-Moline Co.
Mixermobile Mfg. Inc.
Moto-Loaders—see Thew Shovel
Napco Industries, Inc.
Oliver Corp., The
Payloader—see Hough Co., The Frank G.
Pettibone Mulliken Corp.
Quaker Pioneer Rubber Mills
Scoopmobile—see Mixermobile Mfg. Inc.
Speedall—see Pettibone Mulliken Corp.
Thew Shovel Co.
Tracto-Loader—see Tractomotive Corp.
Tractomotive Corp.
Westinghouse Air Brake Co.
Loaders—Mobile Belt Type
"TRAVELOADER"—SEE LE TOURNEAU - WESTINGHOUSE CO.

LOCOMOTIVES

BATTERY
ASEA, SWEDEN

Log Washers

ATLAS CAR & MFG CO., THE
BALDWIN-LIMA-HAMILTON
CORP.
English Electric Export & Trading
Co., Ltd.
Exide Industrial Div. Electric Stor-
age Battery Co.
General Electric Co., Apparatus
Sales Co.
GENERAL ELECTRIC CO., IN-
TERNATIONAL
Goodman Mfg. Co.
GREENSBURG MACHINE CO.
International General Electric Co.
JEFFREY MANUFACTURING CO.
Mancha Storage Battery Locomotive
Div., Goodman Mfg. Co.
Thunus Mek. Verksted, A. S.
Vulcan Iron Works (Pa.)
Wood & Co. Ltd., Hugh
Wood & Sons Ltd., John

COMPRESSED AIR

DEMAG AKTIENGESellschaft
Elmco Corp., The
HACK ENG. CO.
MAYO TUNNEL & MINE EQUIP.
TRAMBAIRE—SEE HACK ENG. CO.
Universal Dredge Mfg. Co.
Universal Trambaire—see Universal
Dredge Mfg.

DIESEL

American Locomotive Co.
FATE-ROOT-HEATH CO., THE
General Electric Co.
GENERAL MOTORS OVERSEAS
OPERATIONS
GREENSBURG MACH. CO.
Gregg Co., Ltd., The
HACK ENG. CO.
Hunslet Engine Co., Ltd., The
International General Electric Co.
Klockner-Humboldt-Deutz, A. G.
LE TOURNEAU-WESTINGHOUSE
CO.
Mancha Storage Battery Locomotive
Div., Goodman Mfg. Co.
Mannesmann Export G.m.b.H.
MAYO TUNNEL & MINE EQUIP.
Miller Machinery Co.
Mineral Engineering Co. (Colo.)
MIRRELES, BICKERTON & DAY,
LTD.
Misoula—see Miller Mach. Co.
MOTOR RAIL, LTD.
National Mine Service Co.
PLYMOUTH LOCOMOTIVE
WORKS
Rogers Bros. Corp.
Rogers Hydramotive—see Rogers
Bros. Corp.
Ruth Co., The
SWITCHMOBILE—SEE LE TOUR-
NEAU-WESTINGHOUSE CO.
TELLURIDE IRON WORKS CO.
Thunus Mek. Verksted, A. S.
Universal Dredge Mfg. Co.
UNIVERSAL—SEE HACK ENG.
CO.
U.S. Industries, Inc.
Vulcan Iron Works (Pa.)

DIESEL-ELECTRIC

Alco Products, Inc.
American Locomotive Co.
ATLAS CAR & MFG. CO., THE
Baldwin-Lima-Hamilton Corp.,
Eddystone Div.
Bron Boverie & Cie, A.G.
Differential Steel Car Co.
FATE-ROOT-HEATH CO., THE
General Electric Co., Apparatus
Sales Div.
GENERAL ELECTRIC CO., IN-
TERNATIONAL
General Motors Corp., Electro-Mo-
tive Div.
GENERAL MOTORS OVERSEAS
OPERATIONS
GREENSBURG MACHINE CO.
HACK ENGINEERING CO.
International General Electric Co.
MIRRELES, BICKERTON & DAY,
LTD.
PLYMOUTH—SEE FATE-ROOT-
HEATH CO., THE
PLYMOUTH LOCOMOTIVE
WORKS
Rogers Bros. Corp.
Rogers Electromotive—see Rogers
Bros. Corp.
Universal Dredge Mfg. Co.
U.S. Industries, Inc.
Vulcan Iron Works (Pa.)

TROLLEY

ASEA, SWEDEN
ATLAS CAR & MFG. CO., THE

Differential Steel Car Co.
General Electric Co., Apparatus
Sales Div.
GENERAL ELECTRIC CO., IN-
TERNATIONAL
Goodman Mfg. Co.
INTERNATIONAL
ELECTRIC CO., GENERAL
Jeffrey Manufacturing Co.
National Mine Service Co.
Thunus Mek. Verksted, A. S.
Vulcan Iron Works (Pa.)
WESTINGHOUSE ELECTRIC
INTERNATIONAL CO.

LOG WASHERS

See Washers

LUBRICANTS

Alemite—see Stewart Warner Corp.
Amalite—see Sonneborn Sons, Inc.,
L.
AP5—see Jet-Lube Inc.
CR—see Jet-Lube Inc.
CALOI—SEE STANDARD OIL
CO. OF CALIF.
Climax Molybdenum Co.
Drucolene—see Drullard Co., How-
ard
Drullard Co., Howard
Esso Standard Oil Co.
Flake Bros. Refining Co., Lubri-
plate Div.
Fluidwick Co.
General Petroleum Corp.
Gulf Oil Corp., Gulf Refining Co.
Hi-Lo—see Sahara Oil Co.
Houghton & Co., E. F.
Imperial Oil & Grease Co.
Jet-Lube Inc.
Keystone Lubricating Co.
Kopp-Kote—see Jet-Lube Inc.
Lead-Cote—see Drullard Co.,
Howard
Lion Brand—see Monsanto Chemi-
cal Co.
Lubriplate—see Flake Bros. Re-
fining Co., Lubriplate Div.
Macmillan Petroleum Corp.
Molub-Alloy—see Imperial & Grease
Co.
Monsanto Chemical Co.
Morocco—see Sahara Oil Co.
OG—see Jet-Lube Inc.
Perma-Film—see Jet-Lube Inc.
Perma-Wick—see Fluidwick Co.
Reziolene—see Sahara Oil Co.
Roder-Blackburn Intl. Corp.
RPM—SEE STANDARD OIL CO.
OF CALIF.
Sahara Oil Co.
Shell Oil Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sonneborn Sons, Inc., L.
Sta-put—see Houghton & Co., E. F.
Standard Oil Company (Indiana)
STANDARD OIL CO. OF CALI-
FORNIA
Stewart Warner Corp.
Texas Co.
Thor Power Tool Co.
Tide Water Associated Oil Co.
Tycol—see Tide Water Associated
Oil Co.
UNION OIL CO. OF CALIFORNIA
U. S. Graphite Co.
VL—see Jet-Lube Inc.
Wrightlube—see Wright Power Saw
and Tool Corp.
Wright Power Saw and Tool Corp.

LUBRICATING SYSTEM

See also Oilers, Air Line

Alemite—see Stewart-Warner Corp.
Bean Rubber Mfg. Co.
BRAVO CORP.
Farval Corp., The
Farval-Dualine—see Farval Corp.,
The
Heyl & Patterson, Inc.
Jet-Lube, Inc.
Lube-jet—see Trico Fuse Mfg. Co.
Lunkenheimer Co., The
Stewart-Warner Corp.
Trabon Engr. Co.
Trico Fuse Mfg. Co.

MACHINE SHOP EQUIPMENT

See Sharpeners

MAGNETIC EQUIPMENT

HEAD PULLEYS AND SUSPENSION MAGNETS

Dings Magnetic Separator Co.
Eries Mfg. Co.
Homer Mfg. Co., The
Humboldt, Klockner-Humboldt-
Deutz, A. G.
Memo—see Magnetic Eng. & Mfg.
Co.
Ohio Electric Mfg. Co.
Rapid Magnetic Machines, Ltd.
F. W. Shrader Co.
Scott-Concentrators
Stearns Magnetic Products Inc.
Thunus Mek. Verksted, A. S.

SEPARATORS

Cargo Mfg. Co.
Crucible Steel Co. of America
Dings Magnetic Separator Co.
Engineers Syndicate, Ltd.
Eries Mfg. Co.
Exolon Co., The
General Electric Co., Carboly Dept.
General Electric Co., Metallurgical
Products Dept.
Homer Mfg. Co., The
Humboldt, Klockner-Humboldt-
Deutz, A. G.
Huntington, Heberlein & Co., Ltd.
Klockner-Humboldt-Deutz, A. G.
Jeffrey-Steffensen—see Jeffrey Mfg.
Co., The
Jeffrey Manufacturing Co.
Johnson, Herbert B.
Knapp & Bates, Ltd.
Krupp, Fried. Maschinen und Stahl-
ban Rheinhausen
Magnetic Engineering & Mfg. Co.
Memo—see Magnetic Engineering
& Mfg. Co.
Sanford Day Iron Works, Inc.
Scott's Concentrators
Stearns Magnetic Products Inc.
Thunus Mek. Verksted, A. S.
Wedag, A. G.

MILL DESIGN

See Plant Design and
Construction

MINE CARS

See Cars, Mine

MINE DOORS

See Doors, Mine

MINE SAFETY EQUIPMENT

See Safety Equipment

MONITORS (HYDRAULIC)

CHIKSAN CO.
Georgia Iron Works Co.
Hydraulic Supply Mfg. Co.
INTELLI-GIANT—SEE CHIKSAN
CO.
Yuba Manufacturing Div., Yuba
Consolidated Industries, Inc.

MOTORS

See also Engines; Electrical
Equipment

AIR MOTORS

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Brown Boverie & Cie A. G.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.
Ltd.
Coppus Engineering Corp.
DEMAG AKTIENGESellschaft
Elmco Corp., The
GARDNER-DENVER CO.

GRAYBAR ELECTRIC CO., INC.
Holman Bros. Ltd.
Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
LEDEEN MFG. CO.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
PISTONAIR—SEE JOY MFG. CO.
Salzgitter Maschinen Aktiengesell-
schaft
Thor Power Tool Co.
TURBINAIR—SEE JOY MFG. CO.
Westinghouse Air Brake Co. Le Roi
Div.
WESTINGHOUSE ELEC. INTL.
CO.

GEAR MOTORS

All-Motor—see Falk Corp., The
Allis Co., The Louis
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
BROWN, INC. DAVID
Christian Engineers, J. D.
Coeur d'Alene Hardware & Foundry
Co.
Conveyor Co., The
Elmco Corp., The
Fairbanks, Morse & Co.
Falk Corp., The
General Dynamics Corp., Electro
Dynamic Div.
General Electric Co., Apparatus
Sales Div.
GENERAL MOTORS OVERSEAS
OPERATIONS
GRAYBAR ELECTRIC CO., INC.
Hillman Co., Inc., C. Kirk
Howell Elec. Motors Co.
Ideal Electric & Mfg. Co.
International General Elec. Co.
Lima Electric Motor Co., The
LINK-BELT CO.
Master Electric Co., The
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Motoreducers—see Falk Corp., The
Pacific—see Western Gear Corp.
Pacific Gear & Tool Works, Inc.
Philadelphia Gear Works, Inc.
Reliance Electric & Engineering Co.
Rite-Lo-Speed—see Christian Engi-
neers, J.D.
Sterling Electric Motors, Inc.
Synchro-gear—see U.S. Electrical Mo-
tors, Inc.
U.S. Electrical Motors, Inc.
Wagner Electric Corp.
Western Gear Corp., (Lynwood)
Western Gear Corp. (S. F.)
Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

HYDRAULIC MOTORS

Berry—see Oliver Iron & Steel Corp.
Oliver Iron & Steel Corp.

MUCKING MACHINES

See Loaders; Shaft Sinking
Equipment

NOZZLES

See Screens, Grizzlies and
Accessories

OILERS, AIR LINE

ATLAS COPCO, A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
Bean Rubber Mfg. Co.
Black Widow—see Bean Rubber
Mfg. Co.
CHICAGO PNEUMATIC TOOL
CO.
Cleveland Vibrator Co.
Consolidated Pneumatic Tool Co.,
Ltd.
Drullard Co., Howard
Elmco Corp., The
GARDNER-DENVER CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Schramm, Inc.
STANDARD OIL CO. OF CALIF.
Stewart-Warner Corp.
Thor Power Tool Co.
Victor Equipment Co.
Watts Regulator Co.

Westinghouse Air Brake Co., Cleve-
land Rock Drill Div.
Westinghouse Air Brake Co., Le
Roy Div.
Wright Power Saw & Tool Corp.

OILS

See Lubricants; Reagents and
Chemicals

OPEN GEARING

See also Gears

Falk Corp., The
Farrel-Birmingham Co., Inc.
Western Gear Corp.

ORE TESTING

ARIZONA TESTING LABORA- TORIES

BOOTH CO., INC., THE
Carpeo Mfg. Inc.
DENVER EQUIPMENT CO.
Dunham Gordon Mfg. & Sales Co.
Galigher Co., The
General Elec. Co., Ltd., The
Humboldt, Klockner-Humboldt-
Deutz, A. G.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
Ledoux & Co.
McDowell Co., Inc. Dwight Lloyd
Divsn.
Mobile Drilling, Inc.
Nucleonic Corp. of America
Osborne Laboratories, Inc., Ray-
mond G.
Rapid Magnetic Machines, Ltd.
SOUTHWESTERN ENGINEERING
CO.
TELLURIDE IRON WORKS CO.
Tracerlab, Inc.
WESTERN MACHY. CO.

OXYGEN BREATHING APPARATUS

See Safety Equipment

PACKING

Boston Woven Hose & Rubber Co.
Centipac—see Johns-Manville Sales
Corp.
Chempak—see Johns-Manville Sales
Corp.
Garlock Packing Co., The
Gatke Corp.
Goodall Rubber Co.
Goodrich Co., B. F., Indus. Prod.
Div.
Goodyear Tire & Rubber Co.
Hewitt-Robins, Inc.
Houghton & Co., E. F.
INTERNATIONAL B. F. GOOD-
RICH
Johns-Manville Sales Corp.
Kearsarge—see Johns-Manville
Sales Corp.
Lee Rubber & Tire Corp., Republic
Rubber Div.
Mogul—see Johns-Manville Sales
Corp.
Porter Co., Inc., H. K., Quaker Rub-
ber Co., Div.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.
Raybestos-Manhattan, Inc.
Rhoads & Sons, J. E.
Sea Rings—see Johns-Manville Sales
Corp.
Service—see Johns-Manville Sales
Corp.
THERMOID CO.
Trim—see Houghton & Co., E. F.
United States Rubber Co.
U. S. Rubber Intl.
Vix-Syn—see Houghton & Co., E. F.

PELLETIZERS AND NODULIZERS

DRAVO CORP.
HARDINGE CO., INC.
Heyl & Patterson, Inc.
International Engr., Inc.
KENNEDY-VAN SAUN MFG. &
ENG. CORP.

Koppers Co., Inc.
Link-Belt Co.
Loesche, Germany
McDowell Co., Inc.
Surface Combustion Corp.

PIPE AND FITTINGS

See also Couplings

Aluminum Pipe
Ames Co., W. R.

ASBESTOS

Air Cel—see The Philip Carey Mfg.
Co.
Armco Drainage & Metal Products,
Inc.
Johns-Manville Sales Corp.
Perfecto—see The Philip Carey Mfg.
Co.
Philip Carey Mfg. Co., The
Protecto—see The Philip Carey Mfg.
Co.
Superlight—see The Philip Carey
Mfg. Co.
Tempchek—see The Philip Carey
Mfg. Co.
Transite—see Johns-Manville

CAST AND STEEL

AMERICAN BRAKE SHOE CO.,
AMER. MANGANESE STEEL
DIV.
American Locomotive Co.
Armco Drainage & Metal Products,
Inc.
BETHLEHEM PACIFIC COAST
STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CW—see National Supply Co., The
Calumet & Hecla, Inc., Calumet Div.
Crane Co.
ELECTRIC STEEL FOUNDRY CO.
G—see Grinnell Co., Inc.
Grinnell Co., Inc.
HADFIELD LTD.
Kaiser Steel Corp.
Lead Lined Iron Pipe Co.
Mannesmann Export G.m.b.H.
McNally Pittsburgh Co.
Michigan Pipe Co.
Mills Iron Wks., Inc.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
National Iron Co.
National Supply Co., The
Pacific Pipe Co.
Pacific Wood Tank Corp.
Porter Co., Inc., H. K., W-S Fit-
tings Div.
Republic Steel Corp.
Spang—see National Supply Co.,
The
Taylor Forge & Pipe Works
United States Steel Corp.
United States Steel Corp., Columbia
Geneva Div.
UNITED STATES STEEL EXPORT
CO.
Victaulic Co. of America
Walworth Co.
Western Foundry Co.
Youngstown Sheet & Tube Co., The

COPPER, BRASS AND BRONZE

Ameco Metal, Inc.
ANACONDA WIRE AND CABLE
CO.
Bridgeport Brass Co.
Chase Brass & Copper Co.
Crane Co.
G—see Grinnell Co., Inc.
Grinnell Co., Inc.
MINE & SMELTER SUPPLY CO.,
THE MARCY MILL DIV.
Pacific Pipe Co.
Phelps Dodge Copper Prod. Corp.
Revere Copper & Brass Inc.
Walworth Co.

PLASTIC

Amercat Corp.
American Hard Rubber Co.
Carton Products Corp.
Clearstream—see Yardley Plastics
Co.
Colonial Plastic Mfg. Co.
Crane Co.
Goodall Rubber Co.
Goodrich Co., B. F., Industrial Prod.
Div.
Grinnell Co., Inc.
Koroseal—see International B. F.
Goodrich
Kraloy Plastic Pipe Co., Inc.
Michigan Pipe Co.
Minnesota Mining & Mfg. Co.,
Irrington Varnish & Insulator,
a Div.
National Tank & Pipe Co.
Pacific Pipe Co.
Quaker Pioneer Rubber Mills
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
Trabon Eng. Co.
United States Rubber Co.
U. S. STEEL CORP., COLUMBIA-
GENEVA DIV.
UNITED STATES STEEL CORP.
UNITED STATES STEEL EXPORT
CO.
Van-Cor—see Colonial Plastics Mfg.
Co.
Walworth Co.
Yardley Plastics Co.
Youngstown Sheet & Tube Co., The

RUBBER LINED

American Hard Rubber Co.
Crane Co.
Goodall Rubber Co.
Goodrich Co., B. F., Industrial Prod.
Div.
INTERNATIONAL B. F. GOOD-
RICH
Michigan Pipe Co.
NAYLOR PIPE CO.
Pacific Pipe Co.
Quaker Pioneer Rubber Mills
Raybestos-Manhattan, Inc.
THERMOID CO.
U. S. Rubber Co.

STEEL, SPIRAL-WELDED

Armco Drainage & Metal Products,
Inc.
Armco Steel Corp.
Hydraulic Supply Mfg. Co.
Lead Lined Iron Pipe Co.
NAYLOR PIPE CO.
Pacific Pipe Co.
Taylor Forge & Pipe Wks.

WOOD

FEDERAL PIPE & TANK CO.
Michigan Pipe Co.
NATIONAL TANK & PIPE CO.
Pacific Pipe Co.
Pacific Wood Tank Corp.
SANTA FE TANK DIV., FLOUR
PRODUCTS CO.
Sutphen, Peter O.

VALVES—see VALVES

PLANT DESIGN AND CONSTRUCTION

Allen and Garcia Co.
BALDWIN-LIMA-HAMILTON
CORP.
BARBER-GREENE CO.
Baukol, Philip J.
BOOTH CO. INC., THE
Braun & Co., C. F., Alhambra,
Calif.
Carpeo Mfg. Inc.
CHAPMAN AND WOOD
Continental Gin Co.
COWIN & CO., INC.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
DRAVO CORP.
Drullard Co., Howard
Fisher Contracting Co.
Elmco Corp., The
Foster Wheeler Corp.
Freyr Design—see Koppers Co.,
Inc.
Galigher Co.

Prospecting Equipment

GOULD & CO., GORDON I.
HACK ENGINEERING CO.
HEWITT-ROBINS INC.
Heyl & Patterson, Inc.
Humboldt, Klockner-Humboldt-
Deutz, A. G.
Kaiser Engineers
Keegel, C. P.
KENNEDY-VAN SAUN MFG.
ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
Koppers Co., Inc.
LINK-BELT CO.
Lintz, Mark
Loesche, Germany
LOEWY-HYDROPRESS—SEE
BALDWIN-LIMA-HAMILTON
CORP.
Longyear Co., E. J.
Lurgi-Ges. Fur Chemie & Huetten-
wesen m.b.H.
MACE CO., THE
MAYO TUNNEL & MINE EQUIP.
McDowell Co., Inc.
Meissner Engrs., Inc., John F.
Menlo Research Lab.
Minerals et Metaux
Minerals Engineering Co. (Colo.)
NATIONAL IRON CO.
Osborne Laboratories Inc., Ray-
mond G.
Osmose Wood Preserving Co. of
America, Inc.
Pioneer Eng. Div., Poor & Co., Inc.
Roberts & Schaefer Co.
Rotolite Corp.
Smith Engineering Works
Snell Inc., Foster D.
SOUTHWESTERN ENGINEERING
CO.
STEARNS ROGER MFG. CO.
STILL & STILL
TELLURIDE IRON WORKS CO.
Timber Engineering Co.
Treadwell Co., Inc., M. H.
U. S. Steel Corp., American Bridge
Div.
Universal Dredge Mfg. Co.
Walvoord, Inc., O.W.
West Chester Chemical Co.
Western Knapp Engineering Co.
WESTERN MACH. CO.
Wilmut Eng. Co.
Wiesser & Cox
World Mining Consultants, Inc.
Yuba Consolidated Industries, Inc.

PNEUMATIC CONCRETING PLACING

Air Placement Equip. Co.
Bondactor—see Air Placement
Equip. Co.
CEMENT GUN CO.
Construction Machinery Co.
Drullard Co., Howard
Elmco Corp., The
Grout-or-Blast—see Air Placement
Equipment Co.
GUNITE—SEE CEMENT GUN CO.
MAYO TUNNEL & MINE EQUIP-
MENT
Mix-elevator—see Air Placement
Equip. Co.
Nucretor—see Air Placement Equip.
Co.

PNEUMATIC TOOLS

See Tools, Air Driven

POSTS

See Arms and Posts

POWDER

See Blasting Supplies

PRESERVATIVES

See Reagents and Chemicals

PROSPECTING EQUIPMENT

See Exploration Equipment

**Manufacturer's Complete Names and Ad-
resses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

Pulleys

PULLEYS

See also Magnetic Equipment
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.

Bodinson Mfg. Co.

Bonded Scale & Machine Co.

Chain Belt Co.

Continental Gin Co.

Conveyor Co., The

Dings Magnetic Separator Co.

Dodge Mfg. Co.

Eberhard Bauer, G.m.b.H.

HEWITT-ROBINS, INC.

Humboldt, Klockner - Humboldt-
Deuts., A. G.

Internadrne—see Yuba Mfg. Co.

Jeffrey Manufacturing Co.

LINK-BELT CO.

Lippmann Engineering Works

Magnetic Eng. & Mfg. Co.

Ogden Iron Works Co.

Reeves Pulley Co.

Rez—see Chain Belt Co.

Sanford-Day-Iron Works Inc.

Spookum Co., Inc., The

STEPHENS-ADAMSON MFG. CO.

TELLURIDE IRON WORKS CO.

Van Gorp Manufacturing Company,
Inc.

Wedg-Gripp—see Christian Engi-
neers, J.D.

Western Foundry Co.

Western Gear Works

Worthington Corp.

Yuba Manufacturing Co.

PULVERIZERS

See Crushers, Grinding Equip-
ment, Laboratory Supplies
Loeche Hartzkleinerungs und
Zementmaschinen ("Loeche
Mills")

PUMPS

ACID

ALLEN-SHERMAN-HOFF PUMP
CO., THE

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.

Amag-Hilpert-Pegnitzhuette A. G.

AMPCO Metal, Inc.

Ampco Centrifugal Pumps — see
Ampco Metal, Inc.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.

Apco—see New York Air Brake Co.,
The, Aurora Pump Div.

Aurora—see New York Air Brake
Co., The, Aurora Pump Div.

BARRETT, HAENTJENS & CO.

Buck & Associates, Carl

Byron Jackson Pumps, Inc.

Carnac—see Carl Buck & Associates

CENTRISEAL—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.

Dean Bros. Pumps, Inc.

Deming Co.

DENVER EQUIPMENT CO.

DENVER FIRE CLAY CO.

DORR-OLIVER, INC.

Duriron Co., Inc., The

ELECTRIC STEEL FOUNDRY CO.

Fairbanks, Morse & Co.

Food Machinery & Chemical Corp.

Peerless Pump Div.

Galigher Co., The

Galigher Sump Pump—see Galigher
Co., The

GARDNER-DENVER CO.

HAZELTON—SEE BARRETT,
HAENTJENS & CO.

HYDROSEAL—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.

INGERSOLL-RAND CO.

International Combustion, Ltd.

Jacuzzi Bros., Inc.

Jaeger Machine Co., The

Krogh Pump & Equipment Co.

LaBour Co.

Mannesmann Export G.m.b.H.

Marlow Pumps—Div. of Bell & Gos-
sett Co.

Mather & Platt Ltd.

Moyno—see Robbins & Myers, Inc.

NAGLE PUMPS, INC.

New York Air Brake Co., The,

Aurora Pump Div.

OLIVITE—SEE DORR-OLIVER,
INC.

Robbins & Myers, Inc.

Vacseal—see Galigher Co., The

Vacseal—see International Com-
bustion Ltd.
WESTERN MACH. CO.
WILFLEY & SONS, INC., A. R.
Worthington Corp.

AIR DRIVEN

ATLAS CONCO AB, SWEDEN

BARRETT, HAENTJENS & CO.

Bryon Jackson Pumps, Inc.

CHICAGO PNEUMATIC TOOL
CO.

Consolidated Pneumatic Tool Co.,
Ltd.

HAZELTON—SEE BARRETT,
HAENTJENS & CO.

INGERSOLL-RAND CO.

Krogh Pump Co. LaBour Co., Inc.,
The

LEDEEN MFG. CO.

Mannesmann Export G.m.b.H.

Marlow Pumps, Div. of Bell & Gos-
sett Co.

Porter Co., Inc., H. K., W-S Fit-
tings Div.

Schramm, Inc.

Stewart-Warner Corp.

Thor Power Tool Co.

Westinghouse Air Brake Co., Le
Roi Div.

FILTRATE

BARRETT, HAENTJENS & CO.

LINERS

Ruhrkunststoff G.m.b.H.

MINE AND DEEP WELL

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

Amag-Hilpert-Pegnitzhuette A.G.

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.

Aurora—see New York Air Brake
Co., The, Aurora Pump Div.

BARRETT, HAENTJENS & CO.

Brownie—see Sanford Day Iron
Works, Inc.

Byron Jackson Pumps, Inc.

CHICAGO PNEUMATIC TOOL CO.

Deming Co., The

Fairbanks Morse Co.

FLYGT-STANCO MFG. CO.

SALES, INC.

GARDNER-DENVER CO.

HAZELTON & PLEUGER—SEE
BARRETT, HAENTJENS &
CO.

INGERSOLL-RAND CO.

Jacuzzi Bros., Inc.

Jaeger Machine Co., The

Johnston Pump Co.

Krogh Pump & Equipment Co.

LaBour Co., Inc., The

Mannesmann Export G.m.b.H.

Marlow Pumps Div., Bell & Gossett
Co.

Mather & Platt Ltd.

Moyno—see Robbins & Myers, Inc.

National Supply Co. (Pa.)

New York Air Brake Co., The,
Aurora Pump Div.

Peerless Pump Div.

Plueger, Unterwasserpumpen
Pumps, Inc.

Rice Pump & Mach. Co.

Robbins & Myers, Inc.

Salzgitter Maschinen Aktiengesell-
schaft

Sanford Day Iron Works

STANCO MFG. & SALES, INC.

Standard Elec. Mfg. Co., Inc.

STENBERG CORPORATION A/B

Turbo-Maschinen A.G.

Wedag A.G.

Worthington Corp.

SAND AND SLIME

ALLEN-SHERMAN-HOFF PUMP
CO., THE

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

Amag-Hilpert-Pegnitzhuette A. G.

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.

AMSCO—SEE AMERICAN BRAKE
SHOE CO.

BARRETT, HAENTJENS & CO.

Bodinson Mfg. Co.

CARPCO MFG. INC.

CENTRISEAL—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.

CHICAGO PNEUMATIC TOOL CO.

Consolidated Pneumatic Tool Co.,
Ltd.

DENVER EQUIPMENT CO.

DORR-OLIVER, INC.

Erie—see Erie Pump & Engine
Works

Erie Pump & Engine Works

Food Machinery & Chemical Corp.

Peerless Pump Div.

Fraser & Chalmers Eng. Wks.

Galigher Co., The

Galigher Sump Pump—see Galigher
Co., The

General Electric Co. Ltd., The

Georgia Iron Works Co.

HAZELTON—SEE BARRETT,
HAENTJENS & CO.

Humboldt, Klockner - Humboldt-
Deuts., A. G.

HYDROSEAL—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.

International Combustion Ltd.

Jaeger Machine Co., The

Johnston Pump Co.

Kansas City Hay Press Co.

Klockner-Humboldt-Deuts., A. G.

Krogh Pump & Equipment Co.

Lightning Pumps—see Kansas City
Hay Press Co.

Linatex Corp. of America

Marlow Pumps, Div. of Bell & Gos-
sett Co.

Morris Machine Works

MORSE BROS. MACHINERY CO.

Moyno—see Robbins & Myers, Inc.

NAGLE PUMPS, INC.

O.D.S.—SEE DORR-OLIVER, INC.

Pettibone-Mulliken Corp.

Plueger, Unterwasserpumpen

Rice Pump & Machine Co.

Robbins & Myers, Inc.

SPANG & CO.

Sweet Iron Works, A. L.

Taylor-Wharton Iron & Steel Co.

TELLURIDE IRON WORKS CO.

Vacseal—see Galigher Co., The

Vacseal—see International Combustion
Ltd.

Wedag A.G.

WEMCO—SEE WESTERN MA-
CHINERY CO.

WESTERN MACHINERY CO.

WILFLEY & SONS INC., A. R.

Wilkinson Linatex Ltd. of Canada

Worthington Corp.

Yuba Manufacturing Div. Yuba
Consolidated Industries, Inc.

VACUUM

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

Anco—see Central Scientific Co. of
Calif.

BARRETT-HAENTJENS & CO.

Braun-Knecht-Heimann

Central Scientific Co. of Calif.

CHICAGO PNEUMATIC TOOL CO.

Consolidated Pneumatic Tool Co.,
Ltd.

Dean Bros. Pumps, Inc.

DORR-OLIVER, INC.

GARDNER-DENVER CO.

HAZELTON—SEE BARRETT,
HAENTJENS & CO.

INGERSOLL-RAND CO.

International Combustion Co.

JOY MFG. CO.

Mannesmann Export G.m.b.H.

Marlow Pumps, Div. of Bell &
Gossett Co.

OLIVER—SEE DORR-OLIVER,
INC.

Peterson Filters & Eng. Co.

Roots-Connorsville Blower

Sarco & Sarcothern Controls

Thunex Mek. Verksted, A. S.

Worthington Corp.

PYRO-

METALLURGICAL

EQUIPMENT

See also Laboratory Equipment
and Supplies; Sintering Ma-
chines; Dryers and Kilns

CONVERTERS

ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP

General Electric Co., Apparatus
Sales Div.

Humboldt, Klockner-Humboldt-
Deuts., A. G.

KENNEDY-VAN SAUN MFG. &
ENG. CORP.

Klockner-Humboldt-Deuts., A. G.

Treadwell Co., Inc., M. H.

CUPELLING FURNACES

MACE CO., THE

REVERBERATORY FURNACES

ALLIS-CHALMERS MFG. CO., IN-
DUSTRIES GROUP

Hevi-Duty Electric Co.

Humboldt, Klockner-Humboldt-
Deuts., A. G.

Klockner-Humboldt-Deuts., A. G.

MACE CO., THE

Treadwell Co., Inc., M. H.

ROASTING FURNACES

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP

COLORADO IRON WORKS CO.

DENVER EQUIPMENT CO.

DORR-OLIVER, INC.

DORR-OLIVER, INC.

GOULD & CO., GORDON I.

HARDINGE CO., INC.

Hartwig, Walter

Hevi-Duty Electric Co.

Humboldt, Klockner-Humboldt-
Deuts., A. G.

Huntington, Heberlein & Co., Ltd.

KENNEDY-VAN SAUN MFG. &
ENG. CORP.

Klockner-Humboldt-Deuts., A. G.

MACE CO., THE

MINE & SMELTER SUPPLY CO.

Nichols Engineering & Research
Corp.

Nichols Herreschoff—see Nichols
Engineering & Research Corp.

PACIFIC FOUNDRY CO., LTD.

Parry—see Silver Eng. Co.

Pollock Co., The William B.

Reagents and Chemicals

FLOCCULENTS

Acrysol CA—see Rohm & Haas Co.
Acrysol CQ—see Rohm & Haas Co.
Allied Chemical & Dye Corp., General Chem. Div.
Cesalpinia s.p.a.
CROWN ZELLERBACH CORP.
Flocal—see Cesalpinia s.p.a.
General Mills, Inc.

FLOTATION REAGENTS

Alamacs, Alamines—see General Mills Inc., Chem. Div.
Allied Chem. & Dye Corp., Barrett Div. American Agricultural Chem. Corp.
AMERICAN CYANAMID COMPANY MINERAL DRESSING DEPT.
Armacs—see Armour Chemical Division
Armour Chemical Division
ATLAS POWER CO.
Braun-Knecht-Heimann Co.
CROWN ZELLERBACH CORP.
Denver Fire Clay Co.
Dow Chemical Co., The
Du Pont de Nemours & Co., Inc., Chemical Div.
Farbwerke Hoechst A.G.
General Mills, Inc., Chemical Div.
Hercules Powder Co.
Koppers Co., Inc.
Matheson Co., Inc., The
Metso—see Philadelphia Quartz Co.
Monsanto Chemical Co.
Monamid, Monamine, Monapon, Monaterre, Monawet—see Monsanto Industries, Inc.
Monsanto Chem. Co.
Newport Industries Co.
ORZANA—SEE CROWN ZELLERBACH CORP.
PQ—see Philadelphia Quartz Co.
Pennsalt Chemicals Corp.
Pentanol—see Sharples Chemicals Inc.
Petroflote—see Sonneborn Sons, Inc., L.
Philadelphia Quartz Co.
Primene 81-R—see Rohm & Haas Co.
Primene JM-T—see Rohm & Haas Co.
Reilly Tar & Chemical Corp.
Rohm & Haas Co.
Sharples Chemicals Inc.
Sonneborn Sons, Inc., L.
Swift & Co., Technical Prod. Plant
UNITED STATES STEEL CORP.
Van Waters & Rogers Inc.
Wedag, A.G.

Ion Exchange Resins

INFILCO, INC.
Matheson Co., Inc., The
Permut Co.
Peterson Filter & Engineering Co.
Rohm & Haas Co.

PRESERVATIVES, TIMBER

Allied Chemical & Dye Corp., Barrett Div.
Berk & Co., Inc., F. W.
Dow Chemical Co., The
Du Pont de Nemours & Co., Inc., Chemical Div.
General Petroleum Corp.
Gilbreath Chemical Co.
Koppers Co., Inc., Wood Preserving Div.
Lerlab Supply Co.
M-T-M, Osmosalts, Osmoplastic, Pentox—see Osmose Wood Preserving Co.
Matheson Co., Inc., The
Mersolites-Berk & Co., Inc.
Monsanto Chemical Co.
Osmoplastic & Osmosalts—see Osmose Wood Preserving Co. of America, Inc.
Osmose Wood Preserving Co. of America, Inc.
Philadelphia Quartz Co.
Reilly Tar & Chemical Corp.
20—see Gilbreath Chemical Co.
U—see Gilbreath Chemical Co.
U. S. STEEL CORP.
Van Waters & Rogers, Inc.
Wolman—see Koppers Co., Inc., Wood Preserving Div.
AMERICAN CYANAMID COMPANY—MINERAL DRESSING DEPT.
AMERICAN POTASH & CHEMICAL CORP.

OTHER ACIDS AND CHEMICALS

Allied Chem. & Dye Corp., Barrett Div.
Allied Chemical & Dye Corp., General Chemical Div.
AMERICAN CYANAMID COMPANY—MINERAL DRESSING DEPT.
AMERICAN POTASH & CHEMICAL CORP.

Amine Liquid Extracts—see Rohm & Haas Co.
Apache Powder Co.
Armour Chemical Division
Atlas Powder Co.
Berk & Co., Inc., F. W.
Braun Corp.
Braun-Knecht-Heimann Co.
Central Scientific Co. of Calif.
CROWN ZELLERBACH CORP.
DENVER FIRE CLAY CO.
Dow Chemical Co., The
du Pont de Nemours & Co., E. I., Chemicals Dept.
Food Machinery & Chemical Corp., Westvaco Chemical Div.
General Mills, Inc., Chemical Div.
Guartec—see General Mills, Inc.
Hercules Powder Co.
JOHNSON MARCH CORP.
Lerlab Supply Co.
Matheson Co., Inc.
Memlo Research Lab.
Merck & Co.
Minerac Corp.
Monsanto Chemical Co.
Nucleonic Corp. of America
Orzans—see Crown Zellerbach Corp.
Pennsalt Chemicals Corp.
Phelps Dodge Refining Corp.
Philadelphia Quartz Co.
Reilly Tar & Chem. Corp.
Rohm & Haas Co.
Sharples Chemicals Inc.
Swift & Co., Technical Prod. Plant
Union Carbide and Carbon Corp.
UNITED STATES STEEL CORP.
Van Waters & Rogers, Inc.
West Chester Chem. Co.
Westvaco-Chlor-Alkali Div., Food Mach. & Chem. Corp.

RECORDERS

See Testing, Recording & Control Equip.

REDUCERS, SPEED

See Speed Changers

REFRACTORIES

Air Placement Equip. Co.
Alfrax—see Carborundum Co., The
Alundum—see Norton Co.
AMERICAN BRAKE SHOE CO.
Axtex—see Mexico Refractories Co.
BABCOCK & WILCOX CO., THE
Blazefraxe—see Johns-Manville
Carbofrax—see Carborundum Co., The
Carborundum Co., The, Refractories Div.
Crytolon—see Norton Co.
DFC—see DENVER FIRE CLAY CO., THE
DENVER FIRE CLAY CO., THE
FIRECRETE—SEE JOHNS-MANVILLE
General Refractories Co.
Harbison-Walker Refractories Co.
Jay Bee—see Mexico Refractories Co.
Johns-Manville Sales Corp.
Kaisai Aluminum & Chem. Corp.
Mexico Refractories Co.
Monofrax—see Carborundum Co., The
Mullfrax—see Carborundum Co., The
Narco—see North Am. Refractories Co.
North American Refractories Co.
Norton Co.
Refrax—see Carborundum Co., The
Robinson Clay Product Co., The
Utah Fire Clay Co.

RESPIRATORS

See Safety Equipment

ROASTING FURNACES

See Dryers and Kilns; Pyrometallurgical Equipment; Sintering Machines

ROCK BOLTS

See Bolts, Rock

ROD MILLS

See Grinding Equipment

RODS

See Grinding Equipment;
Welding Equipment

ROLLS, ROLLERS

See Crushers; Conveyors

ROOF BOLTS

See Bolts, Rock

ROPE, WIRE, AND ACCESSORIES

American Chain & Cable Company, Inc.
American Chain & Cable Co., Inc., Hazard Wire Rope Div.
American Chain & Cable Co., Inc., Wire Rope Div.
American Hoist & Derrick Co., Crosby-Laughlin Div.
Band-it
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Blackburn International Corp.
Bodinson Mfg. Co.
British Ropes Ltd.
Broderick & Bascom Rope Co.
Bullard Co., E. D.
Bullard-Burnham—see Bullard Co., E. D.
Canada Wire & Cable Co., Ltd.
P. S. "R"
Canton Mfg. Co.
Carco—see Pacific Car & Foundry Co.
COLEMAN CABLE & WIRE CO., COLORADO FUEL & IRON CORP.
Crosby—see American Hoist & Derrick Co.
Crucible Steel Co. of America
Edwards Co., F. H.
ELECTRIC STEEL FOUNDRY CO.
Failing Co., Geo. F.
GRAYBAR ELECTRIC CO., INC.
Goodrich Co., The B. F.
GRIPHOIST, INC.
Iron Grip—see Princeton Griphoist Inc.
Jones & Laughlin Steel Corp.
Laughlin Co., The Thomas
Laughlin-Crosby—see American Hoist & Derrick Co.
LE TOURNEAU-WESTINGHOUSE CO.
Leschen Wire Rope—see H. K. Porter Co., Inc.
MacWhyte Co.
Mosebach Electric & Supply Co.
OKONITE CO., THE
Pacific Car & Foundry Co.
Pacific Wire Rope Co.
H. K. Porter Co., Inc., Leschen Wire Rope Div.
Princeton Griphoist Inc.
Punch-Lok Co.
RIBLET TRAMWAY CO.
Roder-Blackburn Intl. Corp.
ROEBLING'S SONS CORP., JOHN
Round Chain Cos.
Ryerson & Son, Inc., Joseph T.
SAUERMAN BROS., INC.
Synflex—see Wall Rope Wks., Inc.
TELLURIDE IRON WKS.
TIGER BRAND—SEE U. S. STEEL EXP. CO.
TOURNAPORE—SEE LE TOURNEAU-WESTINGHOUSE CO.
Union Wire Rope Corp.
U. S. STEEL CORP.
U.S.S.—Tiger Brand—see UNITED STATES STEEL CORP.
LUMBIA-GENEVA STEEL CO. DIV.
U. S. STEEL CORP., TENNESSEE COAL & IRON DIV.
UNITED STATES STEEL CORP., COLUMBIA-GENEVA DIV.
UNITED STATES STEEL EXPORT CO.
Wall Rope Wks., Inc.
Wireco—see Wire Rope Co. of Am. Inc.

Wire Rope Corp., of America, Inc.
WICKWIRE—SEE COLORADO FUEL & IRON CORP., THE

RUBBER PRODUCTS

See Belts; Hose; Conveyor Equipment; Safety Equipment

SAFETY EQUIPMENT

APPAREL

American Optical Co.
Bausch & Lomb Optical Co.
Bullard Co., E. D.
Gardwell—see Safety Clothing & Equipment Co.
Goodall Rubber Co.
Industrial Air Prods. Co.
INTERNATIONAL B. F. GOODRICH
Johns-Manville Sales Corp.
Lehigh Safety Shoe Co.
MARTINDALE ELECTRIC CO.
MINE SAFETY APPLIANCES CO.
Parker Safety Equipment Co.
Pulmosan Safety Equip. Corp.
Saf I—see U. S. Safety Service Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
SKULLGARD—SEE MINE SAFETY APPLIANCES CO.
Sly Mfg. Co., W. W.
United States Rubber Co.
U. S. Safety Service Co.
Wil-Gard—see Wilson Rubber Co., The
Wilson Rubber Co., The

FIREFIGHTING EQUIPMENT

American-LaFrance Corp.
American Rubber Mfg. Co.
Badger Fire Extinguisher Co.
Blackhawk Mfg. Co.
Bullard Co., E. D.
Four Wheel Drive Auto Co., The
General Detroit Corp.
General Fire Extinguisher Corp., The
Goodrich Co., The B. F.
Grinnell Co., Inc.
Industrial Air Prods. Co.
INTERNATIONAL B. F. GOODRICH
Kidde & Co. Inc., Walter
Lee Rubber & Tire Corp., Republic Rubber Div.
MINE SAFETY APPLIANCES CO.
Pulmosan Safety Equipment Corp.
Pyrene-C-O Two
Republic Rubber Div., Lee Rubber & Tire Corp.
Safety Clothing & Equipment Co.
Safety Fire Extinguisher Co.
Safety First Supply Co.
U. S. Safety Service Co.

GENERAL

American Optical Co.
Ampco Metal, Inc.
Atomic Engineering Corp.
Bullard Co., E. D.
Chicago Eye Shield Co.
Gardwell—see Safety Clothing & Equip. Co.
Linde Air Products Co.
Lunkenheimer Co., The
MINE SAFETY APPLIANCES CO.
National First Aid Supply Co.
Ohio Brass Co.
Pulmosan Safety Equipment Corp.
Ray-O-Vac Co.
Rose Mfg. Co.
Safe-Hi—see Rose Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Wilson Products Div., Ray-O-Vac Co.

LIGHTS

A & A Mfg. Co.
EDISON—SEE MINE SAFETY APPLIANCES CO.
Electric Storage Battery Co., The
Exide Ind. Div.
General Electric Co., Lamp Div.
GRAYBAR ELECTRIC CO., INC.
Homelite Corp.
Justrite Mfg. Co.
MARTINDALE ELECTRIC CO.
MINE SAFETY APPLIANCES CO.
Mosebach Electric & Supply Co.
National Mine Service Co.
Ray-O-Vac Co.
Revere Electric Mfg. Co.
Safety First Supply Co.
United States Electric Mfg. Corp.
U. S. Safety Service Co.
Westinghouse Electric Corp.
Westinghouse Electric Corp., Cleveland Div.

KENNEDY-VAN SAUN MFG. & ENG. CORP.
LINK-BELT CO.
 Lippmann Engineering Works
 Macklin Equip Co.
 McLanahan & Stone Corp.
MINERS FOUNDRY & MFG. CO.
NORDBERG MFG. CO.
 Pioneer Engineering Div., Poor & Co., Inc.
 Rogers Iron Works Co.
 Smith Engineering Works
STEARNS ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
 Straub Mfg. Co., Inc.
SYMONS—SEE NORDBERG MFG. CO.
 Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
TRAYLOR ENGR. & MFG. CO.
 Universal Engineering Corp.
 Washington Iron Wks.
 Wedge Wire Corp.
 Yuba Manufacturing Co.

VERTICAL SCREENS

LINK-BELT CO.
NORDBERG MFG. CO.
SYMONS—SEE NORDBERG MFG. CO.

VIBRATING GRIZZLIES

LINK-BELT CO.
NORDBERG MFG. CO.
SYMONS—SEE NORDBERG MFG. CO.

WIRE AND BAR SCREENS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Birly-Zimmer Engineering Co.
CAL-WIG—SEE COLORADO FUEL & IRON CORP., THE
 Chain Belt Co.
 Cleveland Wire Cloth & Mfg. Co.
COLORADO FUEL & IRON CORP., THE
 Conveyor Co., The
 Fraser & Chalmers Eng. Wks.
 Gyratol—see Korb Pettit Wire Fabrics
HACK ENGINEERING CO.
 Haver & Boecker
 Hein Lehmann & Co.
 Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
 Hewitt-Robins Inc., Korb-Pettit Wire Fabrics & Iron Works, Inc., a subsid.
 Iowa Mfg. Co.
 Klockner-Humboldt-Deutz, A. G.
 Korb Pettit Wire Fabrics & Iron Wks., Inc.
LINK-BELT CO.
 Lippmann Engineering Works
 Ludlow-Saylor Wire Cloth Co.
MALIX—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
NORDBERG MFG. CO.
 Ogden Iron Works Co.
 Overstrom & Sons
 Pioneer Eng. Div., Poor & Co., Inc.
PRODUCTIVE EQUIP. CORP.
ROSS SCREBN & FEEDER CO.
 Simplicity Engineering Co.
 Smith Engineering Works
STARSTEEL—see Star Wire Screen & Iron Works, Inc.
 Star Wire Screen & Iron Works, Inc.
 Sta-Clear—see Ludlow-Saylor Wire Cloth Co.
 Sta-Smooth—see Ludlow-Saylor Wire Cloth Co.
 Sta-Tri—see Ludlow-Saylor Wire Cloth Co.
STEARNS-ROGER MFG. CO.
 Super Gyratol-Korb Pettit Wire Fabrics & Iron Works, Inc.
 Super-LOY—see Ludlow-Saylor Wire Cloth Co.
SYMONS—SEE NORDBERG MFG. CO.
 Taylor-Wharton Iron & Steel Co.
TY-LOC—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 Wedge Slot—see Hendrick Mfg. Co.
 Wedge Wire Corp.
 Westfälische Maschinenbau G.m.b.H.

NATIONAL MALLEABLE & STEEL CASTINGS CO.

NORDBERG MFG. CO.
 Ogden Iron Works Co.
 Overstrom & Sons
 Pioneer Eng. Div., Poor & Co., Inc.
PRODUCTIVE EQUIP. CORP.
ROSS SCREBN & FEEDER CO.
 Simplicity Engineering Co.
 Smith Engineering Works
STARSTEEL—see Star Wire Screen & Iron Works, Inc.
 Star Wire Screen & Iron Works, Inc.
 Sta-Clear—see Ludlow-Saylor Wire Cloth Co.
 Sta-Smooth—see Ludlow-Saylor Wire Cloth Co.
 Sta-Tri—see Ludlow-Saylor Wire Cloth Co.
STEARNS-ROGER MFG. CO.
 Super Gyratol-Korb Pettit Wire Fabrics & Iron Works, Inc.
 Super-LOY—see Ludlow-Saylor Wire Cloth Co.
SYMONS—SEE NORDBERG MFG. CO.
 Taylor-Wharton Iron & Steel Co.
TY-LOC—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
 Universal Dredge Mfg. Co.
 Universal Engineering Corp.
 Wedge Slot—see Hendrick Mfg. Co.
 Wedge Wire Corp.
 Westfälische Maschinenbau G.m.b.H.

SPRAY NOZZLES

Carbofrax—see Carborundum Co., The, Refractories Div.
 Carborundum Co., The, Refractories Div.
 Carrier Corp.

Chain Belt Co.
 CONCENCO—SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
 Deister Machine Co.
 Goodrich Co., The B. F.
 Grinnel Co., Inc.
 Iowa Mfg. Co.
LINK-BELT CO.
 Refrax—see Carborundum Co., The, Refractories Div.
 Rex—see Chain Belt Co.
 Spraying Systems Co.
 Yuba Manufacturing Co.

SCRUBBERS**EXHAUST, DIESEL**

Bodinson Mfg. Co.
 Eimco Corp., The
 Hunslet Engine Co. Ltd., The
INTERNATIONAL HARVESTER CO.
 Ocm Diesel Exhaust—see Oxy-Catalyst, Inc.
 Oxy-Catalyst, Inc.
 Ruth Co., The
TELLURIDE IRON WORKS CO.

GAS

Black, Sivalis & Bryson, Inc.
 Johnson-March Corp.
 Klockner-Humboldt-Deutz, A. G.
 National Tank & Pipe Co.
 OCM Catalytic Exhaust, Oxy Muffler Exhaust, Oxy-cat—see Oxy-Catalyst, Inc.
 Oxy-Catalyst, Inc.
 Peterson Filters & Engr. Co.
SANTA FE TANK DIV., FLOUR PRODUCTS CO.
STEARNS-ROGER MFG. CO., THE
WESTERN PRECIPITATION CORP.
 Winslow Eng. & Mfg. Co.

SAND

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Bodinson Mfg. Co.
 Conveyor Co., The
 Gruendler Crusher & Pulverizer Co.
HACK ENGINEERING CO.
HARDINGE CO., INC.
 Iowa Mfg. Co.
LINK-BELT CO.
 Lippmann Engineering Works
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
 McLanahan & Stone Co.
MINE & SMELTER SUPPLY CO., THE
 Rogers Iron Works Co.
 Smith Engineering Works
 Straub Mfg. Co., Inc.
TELLURIDE IRON WKS.
 Universal Dredge Mfg. Co.
 Washington Machinery Co.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.

SELF LOADING**TRANSPORT,****UNDERGROUND**

Eimco Corp., The
 Glamco—see Sanford-Day Iron Works, Inc.
HEWITT-ROBINS, INC.
 Irwin Foundry & Mine Car Co.
 Jeffrey Mfg. Co., The
 Napco Industries, Inc.
 Sanford Day Iron Wks.
 Westinghouse Air Brake Co., (Pa.)
 Westinghouse Air Brake Co., Le Roi Div.

SEPARATORS

See also Magnetic Equipment;
 Classifiers; Concentrators

AIR

American Air Filter Co., Inc.
 CE-Raymond—see Combustion Engineering, Inc.

Combustion Engineering, Inc., Raymond Div.
 DriAir—see New Jersey Meter Co.
 Eimco Corp., The
HARDINGE CO., INC.
 Ingersoll-Rand
 I-T-E Circuit Breaker Co.
 International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
 Klockner-Humboldt-Deutz, A. G.
 Knapp & Bates Ltd.
LOGAN ENGINEERING CO.
 Majac, Inc.
 New Jersey Meter Co.
 Osborne Laboratories Inc., Raymond G.
 Sly, Mfg. Co. W. W. The
STURTEVANT MILL CO.
 Universal Road Machinery Co.
 Williams Crusher & Pulverizer Co.

ELECTROSTATIC

American Air Filter Co., Inc.
 Carpeo Mfg. Inc.
 Johnson, Consultant, Herbert B.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HIGH TENSION

Carpeo Mfg. Inc.
 Dings Magnetic Separator Co.

SETS, STEEL

See Steel

SHAFT COUPLINGS

See Couplings

SHAFT MOUNTED**DRIVES**

See also Drives; Gears; Open Gearing
 Falk Corp., The
LINK-BELT CO.
 Ohio Gear Co., The

SHAFT SINKING**CONTRACTORS**

BOYLES BROS. DRILLING CO.
 Cementation Co. Ltd., The
DRAGO CORP.
 Longyear Co., E. J.
 McClintock
 McKenzie & Whittle Cont.

EQUIPMENT

BARRETT, HAENTJENS & CO.
 Cementation Co. Ltd., The
 Consolidated Pneumatic Tool Co., Ltd.
 CRYDERMAN—SEE SHAFT & DEVELOPMENT MACH. CO.
DEMAG AKTIENGESellschaft
 Eimco Corp., The
 Eisenhutt Prinz Rudolph, A.G.
JOY MFG. CO.
MAYO TUNNEL & MINES EQUIP.
MINERS FOUNDRY & MFG. CO.
 Ogden Iron Works Co.
PINAZZA—SEE VULCAN IRON WKS., (COLO.)
 Shaft & Development Mach.
TELLURIDE IRON WORKS CO.
VULCAN IRON WORKS CO.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.
 Westinghouse Air Brake Co., Le Roi Div.
 Wood & Sons Ltd., John

SHAKERS, CAR

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 Cleveland Vibrator Co.
 Dusterloh, G. Fabrik fur Bergwerksbedarf G.m.b.H.
HEWITT-ROBINS, INC.
LINK-BELT CO.

R & M—see Robbins & Myers, Inc.
 Robbins & Myers, Inc.
 Simplicity Engr. Co.
STEPHENS-ADAMSON MFG. CO.
SYNTRON CO.

SHARPENERS, ROCK**BIT AND STEEL**

ATLAS COPCO A. B. SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
 Bohler, Gebr. & Co. A.G.
 Climax Rock Drill & Engineering Works, Ltd.
 Coeur d'Alene Hardware & Foundry Co.
 Dagenhardt-Utsch K.G.
DEMAG AKTIENGESellschaft DRAGO CORP.
 Flottman-werke G.m.b.H.
 Grindex—see Uddeholm Co. of America, Inc.
INGERSOLL-RAND CO.
MASSCO—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
 Premag G.m.b.H.
 Salzgitte Maschinen A. G.
 Security Engineering Div. Dresser Operations, Inc.
STANCO MFG. & SALES, INC.
 Thor Power Tool Co.
 Uddeholm Co. of America, Inc.

SHEAVES

See Blocks and Sheaves

SHOVELS, POWER

See Excavators

SINKERS

See Drills, Rocks

SINTERING MACHINES

See also Pyrometallurgical

Equipment

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Aoreco—see Koppers Co., Inc.
DRAGO CORP.
 Dwight Lloyd—see McDowell Co., Ltd.
ELECTRIC STEEL FOUNDRY CO.
 Hevi-Duty Electric Co.
 Heyl & Patterson, Inc.
 Huntington, Heberlein & Co., Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
MACE CO., THE
 McDowell Co., Inc., The Dwight Lloyd Div.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
 Pollock Co., The William B.
SMITH & CO., F. L.
 Yuba Manufacturing Co.

SKIPS

See Hoisting Equipment

SLACKLINES

See Excavators

SLINGS

See Rope, Wire

SLUSHERS

See Excavators; Hoisting Equipment; Scrapers

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Smelting & Refining Equipment

SMELTING & REFINING EQUIPMENT

See Pyrometallurgical Equipment

SOLVENTS URANIUM

see Reagents and
Chemicals

SPEED CHANGERS, INCREASES AND/OR REDUCERS

Allis Co., The Louis
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Ampl-Speed—see Electric Machy.
Mfg. Co.
BARBER-GREENE CO.
Bodinson Mfg. Co.
BROWN INC., DAVID
Carpeo Mfg. Inc.
Christian Engineers, J. D.
Cleveland Worm & Gear Co., The
Conveyor Co., The
Cutler-Hammer, Inc.
DEMAG AKTIENGESSELLSCHAFT
Dodge Manufacturing Corp.
Electric Machinery Mfg. Co.
Falk Corp., The
Farrel-Birmingham Co., Inc.
General Dynamic Corp., Electro Dy-
namic Div.
General Electric Co., Apparatus
Sales Div.
General Electric Co., International
HEWITT-ROBINS, INC.
IN-LINE HELICAL—SEE LINK-
BELT CO.
Int'l General Electric Co.
Lima Electric Motor Co.
LINK-BELT CO.
Master Electric Co., The
Metron Instrument Co.
Morse Chain Co.
Multi-Mounts—see Sterling Elec.
Motors, Inc.
NATIONAL IRON CO.
National Supply Co., (Pa.)
Ohio Gear Co.
Oilgear Co., The
PARALLEL SHAFT GEAR—SEE
LINK-BELT CO.
Philadelphia Gear Works, Inc.
P.L.V.—SEE LINK-BELT CO.
RADICON—SEE BROWN INC.,
DAVID
Reeves—see Reliance Electric &
Engr. Co.
Reliance Electric & Engr. Co.
Rite-Lo-Speed—see Christian Engi-
neers, J.D.
SACO—SEE STEPHENS-ADAM-
SON MFG. CO.
Schoonmaker Co. Inc., P. G.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG. CO.
Speedaire—see Cleveland Worm &
Gear, The
STEPHENS-ADAMSON MFG. CO.
Sterling Electric Motors, Inc.
Syncrogear—see U.S. Electrical
Motors, Inc.
TELLURIDE IRON WORKS
Torque-Arm—see Dodge Mfg. Co.
U.S. Electrical Motors, Inc.
Universal Gear Works, Inc.
Varidrive—see U. S. Electrical
Motors, Inc.
VARI PITCH—SEE ALLIS-CHAL-
MERS MFG. CO.
Western Gear Corp. (Lynwood)
Western Gear Corp. (Wash.)
Western Gear Corp., Pacific Gear
Westinghouse Elec. Corp.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.
Worthington Corp.
Yuba Manufacturing Co.

SPIRALS

See Concentrators

SPOTTERS, CAR

Advance Car Mover Co., Inc.
Aldon Company, The
Appleton—see Advance Car Mover
Corp.
Badger Line—see Advance Car
Mover Co., Inc.

Bodinson Mfg. Co.
Brownie—see Sanford Day Iron
Wks.
Christian Engineers, J.D.
Clyde Iron Works, Inc.
CONNELLSVILLE MFG. & MINE
SUPPLY CO.
Gregg Co., Ltd.
HEWITT-ROBINS, INC.
Hough Co., The Frank G.
Jeffrey Manufacturing Co., The
JOY MANUFACTURING CO.
LINK-BELT CO.
Nolan Co., The
Nolan Porta-Feeder—see Nolan Co.,
The
Sanford Day Iron Wks.
STEPHENS-ADAMSON MFG. CO.
Superior-Lidgerwood-Mundy Corp.
Vulcan Iron Works (Pa.)

STEEL

See also Bits, Sets

ALLOY STEEL

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
Armco Drainage & Metal Prods.,
Inc.
Armco Steel Corp.
ATLAS COPCO AB, SWEDEN
ATLAS COPCO PACIFIC, INC.
BETHLEHEM PACIFIC COAST
STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Co.
Crucible Steel Co. of America
ELECTRIC STEEL FOUNDRY CO.
Firth Sterling, Inc.
HADFIELD LTD.
Jones & Laughlin Steel Corp.
Junction Bit & Tool Co.
Kaiser Steel Corp.
Manganal—see Stuls-Sickles Co.
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
SANDVIK COROMAT—SEE AT-
LAS COPCO, A.B. SWEDEN
SHEFFIELD DIV., ARMCO STEEL
CORP.
SHEFFIELD STEEL CORP.
Sterling—see Firth Sterling, Inc.
Stuls-Sickles Co.
Taylor-Wharton Iron & Steel Co.
TIMKEN ROLLER BEARING CO.,
THE
Uddia-Uddenholm Co. of America
UNITED STATES STEEL EXPORT
CO.
USS—SEE U.S. STEEL CORP.
U.S. STEEL CORP.
COLUMBIA-GENEVA DIV.
Youngstown Sheet & Tube Co., The

DRILL STEEL

ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
ATLAS COPCO, A.B. SWEDEN
Bedford & Sons, Ltd., John
BETHLEHEM PACIFIC COAST
STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
BRUNNER & LAY INC.
Crucible Steel Co. of America
Drullard Co., Howard
Fagersta A.B.
Firth Sterling, Inc.
GARDNER-DENVER CO.
HADFIELD LTD.
HAGERSOLD-RAND CO.
Jones & Laughlin Steel Corp.
JOY MFG. CO.
Pennsylvania Drilling Co.
Porto Tool Co.
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
SHEFFIELD DIV., ARMCO STEEL
CORP.
Stahlwerke Sudwestfalen A.G.
Thor Powder Tool Co.
Uddeholms Aktiebolag
Uddia Uddeholm Co. of America
VAREL MFG. CO.
Westinghouse Air Brake Co., Le
Roi Div.

SETS—CIRCULAR STEEL

ALLISON STEEL MFG. CO.
August Thyssen-Hütte A.G.
BETHLEHEM PACIFIC COAST
STEEL CORP.

Bochumer Eisenhütte Heintemann
& Co.
Chapman-Dyer Steel Co.
COLORADO FUEL & IRON
CORP., THE
Commercial Shearing & Stamping
Co.
Rothe Erde Eisenwerk G.m.b.H.

Yieldable Steel

Bethlehem Steel Corp.
Bethlehem Steel Export Corp.

STRUCTURAL STEEL

ALLISON STEEL MFG. CO.
BETHLEHEM PACIFIC COAST
STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Bodinson Mfg. Co.
C F & I—SEE COLORADO FUEL
& IRON CORP., THE
COLORADO FUEL & IRON CORP.,
THE
Commercial Shearing & Stamping
Co.
Humboldt Div. Klockner-Humboldt-
Deutz, A. G.
Jones & Laughlin Steel Corp.
Kaiser Steel Corp.
Mannesmann Export G.m.b.H.
NATIONAL IRON CO.
Ogden Iron Works Co.
Pacific Car & Foundry Co.
Pohlig, J., A.G.
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
SHEFFIELD DIV., ARMCO STEEL
CORP.
TENNESSEE COAL & IRON DIV.,
U. S. STEEL CORP.
U. S. STEEL CORP., AMERICAN
BRIDGE DIV.
UNITED STATES STEEL CORP.,
COLUMBIA-GENEVA DIV.
UNITED STATES STEEL EXPORT
CO.
USS—SEE UNITED STATES
STEEL CORP.
Youngstown Sheet & Tube Co., The
Yuba Mfg. Co.

STOPERS

See Drills, Rock

SURVEYING

INSTRUMENTS & EQUIPMENT

See also Engineering and Draft-
ing Equipment; Exploration
Equipment

Ainsworth & Sons, Inc., Wm.
Bausch & Lomb Optical Co.
Berger & Sons, Inc., C.L.
Brunton Transit—see Wm. Ains-
worth & Sons, Inc.
Detron Corp.
Eberline Inst. Div.—Reynolds Elect.
& Eng. Co.
Geo-Optic Co. Inc.
Gurley, W. & L.E.
International Geophysics, Inc.
Kern Instruments, Inc.
Keuffel & Esser Co.
Laico—Los Angeles Scientific In-
strument Co.
Longyear Corp., E. J.
Lufkin Rule Co.
Mento Research Lab.
Precision Radiation Instruments,
Inc.
Radiac Co., Inc., The
Rocky Mountain Instrument Co.
Rohite Corp.
Universal Atomics
Victoreen Instrument Co., The
White Instrument Co., David
WILD HEERBRUGG INSTRU-
MENTS, INC.

SWITCHES, RAIL

See Track and Accessories

TANKS

See Concentrators

TANKS

See Thickeners and Tanks;
Agitators and Conditioners

TELEPHONES

See Communications

TELEVISION, INDUSTRIAL

Du Mont Laboratories, Inc., Allen
B.
International General Electric Co.
International Geophysics, Inc.
MINE SAFETY APPLIANCE CO.
Philips Electronics, Inc., Instru-
ments Div.

TESTING

See Laboratories

TESTING, RECORDING & CONTROL EQUIPMENT

See also Gauges; Scales; Tele-
vision, Industrial

MILL CONTROL

ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Analytical Measurements, Inc.
Beckman Instruments, Inc., Scien-
tific Instruments Div.
BENDIX AVIATION CORP.
Bristol Co., The
Cutler-Hammer, Inc.
Euclid Electric & Mfg. Co.
Fischer & Porter Co.
General Electric Co., Apparatus
Sales Div.
Industrial Physics & Electronics
Co.
INFILCO, INC.
LINK-BELT CO.
MASSCO-ADAMS—SEE MINE &
SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Norwood Controls Unit.
Philadelphia Gear Works, Inc.
Reliance Electric & Engineering
Co.
Westinghouse Electric Corp.

PYROMETALLURGICAL CONTROL

ABCs Scale Division, McDowell
Co., Inc.
ALLIS-CHALMERS MFG. CO.,
INDUSTRIES GROUP
Barber-Colman Co.
Bristol Co., The
Foxboro Co., The
General Electric Co., Apparatus
Sales Div.
Industrial Physics & Electronics
Co.
Leeds & Northrop Co.
Minneapolis-Honeywell Regulator
Co.
Pyro—see Pyrometer Instrument
Co., Inc.
Pyrometer Instrument Co., Inc.
Robertshaw-Fulton Controls Co.
Weston Instruments, Div. of Day-
strom, Inc.
Wheel Co., Instruments Div.

RECORDERS

ABCs Scale Division, McDowell Co.,
Inc.
Barber-Colman Co.
Bristol Co., The
Douglas & Gierans
Electronix—see Minneapolis-Honey-
well Regulator Co.
Esterline Angus Co., Inc.
Fischer & Porter Co.
Foxboro Co., The
General Electric Co., Apparatus
Sales Div.
Industrial Physics & Electronics
Co.

INFILCO, INC.

Leeds & Northrop Co.
LOGAN ENGR. CO.
MINE SAFETY APPLIANCE CO.
 Minneapolis-Honeywell-Heiland Div.
 Minneapolis-Honeywell Regulator Co.

Penn. Instrument Corp.
 Permutit Co., The
 Pyrometer Instrument Co., Inc.
 Richardson Scale Co.
 Robertshaw-Fulton Controls Co.
 Seismograph Service Corp.
 Texas Instruments, Inc. (Dallas)
 Westinghouse Electric Corp.
 Weston Instruments Div. of Dayton, Inc.
 Wheelo, Instruments Div., Barber-Colman Co.

THICKENERS AND TANKS

See also Cyclones

STEEL TANKS

ALLISON STEEL MFG. CO.
 Bethlehem Steel Corp.
BETHLEHEM STEEL EXPORT CORP.
 Bird Machine Co.
 Black, Sivalis & Bryson, Inc.
 Rodinson Mfg. Co.
 Butler Mfg. Co.
COLUMBIAN STEEL TANK CO.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
 Eimco Corp., The
 Enterprise Eng. & Mach. Co.
 General American Transportation Corp.
 Gregg Co., Ltd., The
HACK ENGR. CO.
HEAD WRIGHTSON, STOCKTON FORGE, LTD.
 Hirsch Bros. Machinery Co.
 Hydraulic Supply Mfg. Co.
 Kaiser Steel Corp.
 Klockner-Humboldt-Deutz, A. G.
 Link-Belt Co.
 Michigan Pipe Co.
MINERS FOUNDRY & MFG. CO.
 Morse Bros. Machinery Co.
 Ogden Iron Works Co.
 Pollock Co., The Wm. B.
 Sanford-Day Iron Works Inc.
 Saracco Tank & Welding Co.
STEARNS-ROGER MFG. CO.
 Washington Mach. Co.
 Wilnot Engineering Co.
 Yuba Manufacturing Div. Yuba Consolidated Industries, Inc.

THICKENERS

ALLISON STEEL MFG. CO.
 Butler Mfg. Co.
 Chain Belt Co.
COLUMBIAN STEEL TANK CO.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
 Eagle Iron Works
 Eimco Corp., The
 Float-Treat Sea Chain Belt Co.
HARDING CO., INC.
 Hirsch Bros. Machy. Co.
 International Combustion Ltd.
 Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
MINERS FOUNDRY & MFG. CO.
MORSE BROS. MACHINERY CO.
 Ogden Iron Works Co.
 Santa Fe Tank Div., Fluor Prods. Co.
 Saracco Tank & Welding Co.
STEARNS-ROGER MFG. CO.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
 Westfälische Maschinenbau G.m.b.H.

WOOD TANKS

BAGAC—SEE MAHOGANY IMPORTING CO.
 Black, Sivalis & Bryson, Inc.
DENVER EQUIP. CO.
FEDERAL PIPE & TANK CO.
MAHOGANY IMPORTING CO.
 Michigan Pipe Co.
MORSE BROS. MACHINE CO.
NATIONAL TANK & PIPE CO.
 Pacific Wood Tank Corp.
 Santa Fe Tank Div., Fluor Corp.
WINDELER CO., LTD., GEORGE

TIES, TRACK

See Track and Accessories

TIMBER**CONNECTORS & TOOLS**

Timber Engineering Co.

MINE

Koppers Co., Inc.
 Osmose Wood Preserving Co. of America, Inc.

SHAFT GUIDES

BAGAC—SEE MAHOGANY IMPORTING CO.
GENERAL HARDWOOD CO.
 Stanton & Sons, Inc., E. J.

TIMBER FRAMING MACHINES
STEARNS-ROGER MFG. CO.

TIRES AND TUBES, OFF-HIGHWAY

Dunlop Rubber Co., Ltd.
 Firestone Tire & Rubber Co., The
 Gates Rubber Co.
 Goodrich Co., The B. F.
 Goodyear Tire & Rubber Co.
INTERNATIONAL B. F. GOODRICH
 U. S. Royal—see U. S. Rubber
 United States Rubber Intl.

TOOLS, AIR DRIVEN-PORTABLE

See also Drills, Rock
ATLAS COPCO, AB SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
 Hand-it Co.
 Bohler, Gebr. & Co. AG.
CHICAGO PNEUMATIC TOOL CO.
 Consolidated Pneumatic Tool Co., Ltd.
 Dagenhardt-Utsch KG.
 Flotman-Werke, G.m.b.H.
GARDNER-DENVER CO.
 Haubinc, Maschinenfabrik
 Hausherr, Rudolf & Son G.m.b.H.
 Holman Bros. (Canada) Ltd.
 Holman Bros. (England) Ltd.
INGERSOLL RAND CO.
JOY MFG. CO.
 Le Roi Div. Westinghouse Air Brake Co.
 Loranco—see Newage Intl., Inc.
 National Supply Co., (Pa.)
 Porter, Inc., H. K.
 Prema, G.m.b.H.
 Schramm, Inc.
 Thor Power Tool Co.
VULCAN IRON WORKS CO.
 Westinghouse Air Brake Co., Le Roi Div.
 Worthington Corp.
 Wright Power Saw & Tool Corp.

TOOLS, INDUSTRIAL**GUN**

MINE SAFETY APPLIANCE CO.
 Remington Arms Co., Inc.
 Remington Industrial Gun—see Remington Arms Co.

TORQUE CONVERTERS

SEE TRANSMISSIONS

TRACK & ACCESSORIES**RAIL AND TIES, STEEL**

Aldon Co., The
ALLISON STEEL MFG. CO.,

BETHLEHEM PACIFIC COAST STEEL CORP.

Bethlehem Steel Co.
 Bethlehem Steel Export Corp.
 Brown Boveri & Cie A.G.
C F & I—SEE COLORADO FUEL & IRON CORP., THE
 Central Frog & Switch Co., The
COLORADO FUEL & IRON CORP., LTD.
 Gregg Co., Ltd., The
 Koppers Co., Inc.
 Mosebach Electric & Supply Co.
 Reilly Tar & Chem. Co.
 Ryerson & Son, Inc., Joseph T.
 U.S. Industries, Inc.
UNITED STATES STEEL CORP.
COLUMBIA-GENEVA DIV.
U. S. STEEL CORP., TENNESSEE COAL & IRON DIV.
UNITED STATES STEEL EXPORT CO.
USS—SEE U. S. STEEL CORP.

SWITCHES, FROGS, CROSSINGS, ETC.

Aldon Company, The
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMERICAN MINE DOOR CO.
AMSCO—SEE AMERICAN BRAKE CO.
ATLAS CAR & MFG. CO., THE
BETHLEHEM PACIFIC COAST STEEL CORP.
 Bethlehem Steel Co.
 Bethlehem Steel Export Corp.
CARD IRON WORKS CO., THE, C. S.
 Central Frog & Switch Co., The
 Eimco Corp., The
ELECTRI-THROW—SEE AMERICAN MINE DOOR CO.
 Gregg Co., Ltd., The
 Hockensmith Corp., The
 Jim Crow—see the Aldon Company
 Mosebach Electric & Supply Co.
 Nolan Co., The
 Pettibone-Mulliken Corp.
 Salzgritter Maschinu Aktiengesellschaft
 Samson—see the Aldon Co.
 Taylor-Wharton Iron & Steel Co.
 U.S. Industries, Inc.
USS—SEE U. S. STEEL CORP.
U. S. STEEL CORP. COLUMBIA-GENEVA DIV.
 United States Steel Export Co.
 Weir Kilby Corp.

TRACTORS & ATTACHMENTS

See Engine Exhaust Conditioners, Underground

FORK LIFT TRUCKS

Hyster Co.

TRACTORS

Agri-cat—see Joost Mfg. Co.
 Allis-Chalmers Mfg. Co., Buda Div.
ALLIS-CHALMERS MANUFACTURING CO., CONSTRUCTION MACHY. DIV.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
 American Tractor Equipment Corp.
 Autocar—see The White Motor Co., Autocar Div.
 Brown Industries, David
 Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONSTRUCTION MACHY. DIV.
DROTT MFG. CORP.
 Eimco Corp., The
 Federal Motor Truck Co., Div. of
 Napco Industries, Inc.
GENERAL MOTORS CORP., EUCLID DIV.
GENERAL MOTORS OVERSEAS OPERATIONS
 Hough Co., The Frank G.
INTERNATIONAL HARVESTER CO.
INTERNATIONAL HARVESTER EXPORT CO.
 Joost Mfg. Co.
 Joy Mfg. Co.
 Kaelble, Carl G.m.b.H.
LE TOURNEAU WESTINGHOUSE CO.
 Libu Shovel Co., AB.
 Minneapolis-Moline Co.
 Oliver Corp., The
 Pacific Car & Foundry Co.
 Pence & Co., Inc., Earl H.
PULLMAN—SEE INTERNATIONAL HARVESTER EXPORT CO.
 Service Supply Corp.
 Skid-Shovel—see Drott Manufacturing Corp.
 Skookum Co., Inc., The
 Taylor-Wharton Iron & Steel Co.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
 Tracto-Rippers—see Tractomotive Corp.
 Tracto-shovel—see Tractomotive Corp.
 Tractomotive Corp.
VICKERS-ARMSTRONGS (TRACTORS) LTD.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.
 Westinghouse Air Brake Co., Le Roi Div.
 Yuba Consolidated Industries, Inc.

Joost Mfg. Co.
 Joy Mfg. Co.
 Kaelble, Carl G.m.b.H.
 Klockner-Humboldt-Deutz, A. G.—see Diesel Energy Corp.
LE TOURNEAU WESTINGHOUSE CO.
MACK TRUCKS, INC.
 Massemann Export G.m.b.H.
MICRICAN TURBO-DOZER—SEE CLARK EQUIPMENT CO.
 Minneapolis-Moline Co.
 MRS Mfg. Co.
 Napco Industries, Inc.
 Oliver Corp., The
 Pence & Co., Inc., Earl H.
 Performer—see Westfall Equipment Co.
 Sheppard Co., R.H.
TOURNATRATORS—SEE LE TOURNEAU-WESTINGHOUSE CO.
VICKERS-ARMSTRONGS (TRACTORS) LTD.
 Westfall Equipment Co.
 Westinghouse Air Brake Co. (Pa.)
 Westinghouse Air Brake Co., Le Roi Div.
 White Motor Co., The, Autocar Div.
 Wooldridge Mfg. Div. Continental
 Copper & Steel Industries

ATTACHMENTS

Allis-Chalmers Mfg. Co., Buda Div.
ALLIS-CHALMERS MANUFACTURING CO., CONST. MACHY. DIV.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
 American Tractor Equipment Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
 Ateco—see American Tractor Equipment Corp.
BUCYRUS-ERIE—SEE INTERNATIONAL HARVESTER EXPORT CO.
 Carco—see Pacific Car & Foundry Co.
 Carroll Tractor Parts—see Craig Carroll Co.
 Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACHY. DIV.
 Craig Carroll Co.
DROTT MFG. CORP.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
 Gar Wood Industries, Inc.
GENERAL MOTORS OVERSEAS OPERATIONS
 Hail Co., The
 Hensley Equip. Co.
 Hercules Gallion Products, Inc.
HOUGH—SEE INTERNATIONAL HARVESTER EXPORT CO.
 Hough Co., The Frank G.
 Hyster Co.
INTERNATIONAL HARVESTER CO.
INTERNATIONAL HARVESTER EXPORT CO.
 Joost Mfg. Co.
 Joy Mfg. Co.
 Kaelble, Carl G.m.b.H.
LE TOURNEAU WESTINGHOUSE CO.
 Libu Shovel Co., AB.
 Minneapolis-Moline Co.
 Oliver Corp., The
 Pacific Car & Foundry Co.
 Pence & Co., Inc., Earl H.
PULLMAN—SEE INTERNATIONAL HARVESTER EXPORT CO.
 Service Supply Corp.
 Skid-Shovel—see Drott Manufacturing Corp.
 Skookum Co., Inc., The
 Taylor-Wharton Iron & Steel Co.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
 Tracto-Rippers—see Tractomotive Corp.
 Tracto-shovel—see Tractomotive Corp.
 Tractomotive Corp.
VICKERS-ARMSTRONGS (TRACTORS) LTD.
 Westinghouse Air Brake Co., Cleveland Rock Drill Div.
 Westinghouse Air Brake Co., Le Roi Div.
 Yuba Consolidated Industries, Inc.

TRAILERS

See Trucks and Trailers

TRAMMERS

See Locomotives

Tramways, Aerial

TRAMWAYS, AERIAL

BUCKETS

AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.
RIBLET TRAMWAY CO.
Sanford-Day Iron Works, Inc.
STEARNS-ROGER MFG. CO.
U. S. STEEL CORP., AMERICAN
STEEL & WIRE DIV.
Yara Engineering Corp., Interstate
Equipment Div.

CABLE

BETHLEHEM PACIFIC COAST
STEEL CORP.
Bodinson Mfg. Co.
British Ropes Ltd.
Canada Wire & Cable Co., Ltd.
Leschen Wire Rope Div., H. K.
Porter Co.
RIBLET TRAMWAY CO.
Roebblings Sons Corp.
SAUERMAN BROS., INC.
United States Steel Corp., Columbia-
Geneva Div.
UNITED STATES STEEL
EXPORT CO.
Washington Iron Works

TOWERS

ALLISON STEEL MFG. CO.
Bodinson Mfg. Co.
Gregg Co., Ltd.
RIBLET TRAMWAY CO.
SAUERMAN BROS., INC.
STEARNS-ROGER MFG. CO.
TELLURIDE IRON WORKS.
Yara Engineering Corp., Interstate
Equipment Div.

TRANSFERS, CAR

AMERICAN MINE DOOR COM-
PANY
ATLAS CAR & MFG. CO., THE
Bodinson Mfg. Co.
CANTON—SEE AMERICAN
MINE DOOR COMPANY
CARD IRON WORKS CO., THE
C. S.
Gregg Co., Ltd.
International Engineering, Inc.
MAYO TUNNEL & MINE EQUIP.
Ogden Iron Works Co.
Sanford-Day Iron Works, Inc.
TELLURIDE IRON WORKS CO.
UNITED STATES STEEL CORP.
Yuba Consolidated Industries, Inc.

TRANSITS

See Surveying Instruments &
Equipment

TRANSMISSIONS

AND TORQUE

CONVERTERS

See also Torque Converters
ALLISON—SEE GENERAL MO-
TORS OVERSEAS OPERA-
TION
American Blower Div. of American
Standard
Berry—see Oliver-Iron & Steel
Corp.
Caterpillar Tractor Co.
Cleveland Worm & Gear Co., The
Dodge Mfg. Corp.
Flexidyne—see Dodge Mfg. Corp.
Four Wheel Drive Auto Co., The
General Motors Corp., Allison Div.
GENERAL MOTORS OVERSEAS
CORP.
Koppers Co., Fast's Coupling Dept.
Lima Electric Motor Co.
National Supply Co., The
Oliver Iron & Steel Corp.
Philadelphia Gear Works, Inc.
Reeves—see Reliance Electric &
Engineering Co.
Reeves Fuller Co.
Reliance Electric & Engineering Co.
Schneider Mfg. Corp.
Sterling Electric Motors, Inc.
Twin Disc Clutch Co.
U. S. Electrical Motors, Inc.
Varidrive—see U. S. Electrical
Motors, Inc.
Western Gear Corp. (Lynwood)
Western Gear Corp. (Wash.)
Western Gear Corp. Pacific Gear
Plant

TRIPPERS

See Conveyor Equipment

TROLLEY EQUIPMENT

See also Locomotives
COLORADO FUEL & IRON CORP.
Elreco Corp., The
Jeffrey Mfg. Co.
Mosebach Electric & Supply Co.
Ohio Brass Co.
Ohio Hoist & Mfg. Co.
WESTINGHOUSE ELECTRIC IN-
TERNATIONAL CO.

TROMMELS

See Screens, Grizzlies, and
Accessories

TRUCKS

See Cars, Mine

TRUCK AND TRAILERS

See also Haulage Units

ON-HIGHWAY

ALLISON STEEL MFG. CO.
Autocar—see White Motor Co., The
Autocar Trucks Div.
Butler Mfg. Co.
Chrysler Corp., Dodge Div.
DART TRUCK CO.
FWD—Four Wheel Drive Auto Co.,
The
Federal Motor Truck Co.
Four Wheel Drive Auto Co., The
Fruehauf Trailer Co.
Gallion Allsteel Body Co.
General Motors Corp., GMC Truck
& Coach Div.
GENERAL MOTORS OVERSEAS
OPERATIONS
Hercules Steel Products
INTERNATIONAL—SEE INTER-
NATIONAL HARVESTER EX-
PORT CO.
International Harvester Co.
INTERNATIONAL HARVESTER
EXPORT CO.
Kaelble, Carl G.m.b.H.
KENWORTH MOTOR TRUCK
CORP.
Klockner-Humboldt-Deutz, A. G.
KOEHRING CO.
MACK TRUCKS INC.
Mannesmann Export G.m.b.H.
Moab Drilling Co.
Napco Industries, Inc.
Rogers Bros., Corp.
White Motor Co., The, Autocar
Trucks Div.

OFF-HIGHWAY

Athey Products Corporation
Augsburg-Nurnberg A.G., Maschin-
enfabrik (M.A.N.)
Autocar—see The White Motor Co.,
Autocar Trucks Div.
AVALING-BARFORD, LTD.
Butler Mfg. Co.
Chrysler Corp., Dodge Div.
DART TRUCK CO.
Easton Car & Construction Co.
Enterprise Engine & Mach. Co.
EUCALID—SEE GENERAL MO-
TORS OVERSEAS OPERA-
TIONS
EUCALID DIV., GENERAL MO-
TORS CORP.
FW—Four Wheel Drive Auto
Co., The
Federal Motor Truck Co.
Fodens Ltd.
Four Wheel Drive Auto Co., The
Fruehauf Trailer Co.
Gallion Allsteel Body Co.
GENERAL MOTORS CORP.,
EUCALID DIVISION

GENERAL MOTORS OVERSEAS OPERATIONS

GETMAN BROS. MFG. DIV. INC.
Gottwald, Leo
Heil Co., The
Hercules Steel Products Co.
INTERNATIONAL—SEE INTER-
NATIONAL HARVESTER
EXPORT CO.
INTERNATIONAL HARVESTER
CO.
INTERNATIONAL HARVESTER
EXPORT CO.
Irwin Foundry & Mine Car Co.
Kaelble, Carl G.m.b.H.
KENWORTH MOTOR TRUCK
CORP.
KOEHRING CO.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE
CO.
MACK TRUCKS INC.
Mamon-Herrington Co., Inc.
Moab Drilling Co.
Napco Industries, Inc.
Ore Trucks, Inc.
Rogers Brothers Corp.
SCOOT-CRETE—SEE GETMAN
BROS. MFG. DIV. INC.
TOURNAHOPPER—SEE LE
TOURNEAU-WESTINGHOUSE
CO.
TOURNAOCHER—SEE LE
TOURNEAU-WESTINGHOUSE
CO.
Westinghouse Air Brake Co. (Pa.)
White Motor Co., The Autocar
Trucks Div.

TRUCK OR TRAILER BODIES

ALLISON STEEL MFG. CO.
Easton Car & Construction Co.
Enterprise Engine & Mach. Co.
Fruehauf Trailer Co.
Gallion Allsteel Body Co.
Gar Wood Industries Inc.
GENERAL MOTORS OVERSEAS
OPERATIONS
Gregg Co., Ltd., The
Heil Co., The
Hercules Steel Products Co.
Hockensmith Corp., The
Kenworth Motor Truck Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE
CO.
Penn—see Hockensmith Corp.
Schwartz Mfg. Co.
WINTER WEISS CO.

TUNGSTEN CARBIDE

PRODUCTS

Adamas Carbide Corp.
AMERICAN BRAKE SHOE CO.,
AMERICAN MANGANESE
STEEL DIV.
AMSCO—SEE AMERICAN BRAKE
SHOE CO.
ATLAS COPCO, AB SWEDEN
ATLAS COPCO EASTERN, INC.
ATLAS COPCO PACIFIC, INC.
BRUNNER & LAY, INC.
Carboly—see General Electric Co.
Eutectic Welding Alloys Corp.
Firth Sterling Inc.
Firthite—see Firth Sterling Inc.
General Electric Company—Carbo-
ly Dept.
General Electric Co., Metallurgical
Products Dept.
Haynes Stellite Co.
Haystellite—see Haynes Stellite Co.
INTERNATIONAL GENERAL
ELECTRIC CO.
Intra-Set—see Brunner & Lay, Inc.
Junction Bit & Tool Co.
KENNAMETAL INC.
Longyear Co., E. J.
Manchester Bit Corp.
McCauley Industrial Corp.
Metal Carbide Corp.
National Carbon Co.
National Carbide Co.
ROK-BITS—SEE BRUNNER &
LAY, INC.
STOODY CO.
Uddeholm Co. of America
Vascoloy-Ramet Corp.
WESTERN ROCK BIT MFG. CO.

VACUUM FILTERS

See Filters

VACUUM PUMPS

See Pumps

VALVES

ALLEN-SHERMAN-HOFF PUMP
CO. THE

ACF Industries, Inc., American Car
& Foundry Div.
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL
DIV.
American Chain & Cable Co., Inc.,
R P & C Valve Div.
American Hard Rubber Co.
American Locomotive Co.
Ampeco Metal, Inc.
BARRETT, HAENTJENS & CO.
Black, Sivalis & Bryson, Inc.
Bridgeport Brass Co.
Bristol Co., The
Chase Brass & Copper Co.
Coeur d'Alene Hardware & Foundry
Co.
Crane Co.
Duriron Co., Inc., The
ELECTRIC STEEL FOUNDRY
CO.
EQUIPMENT ENGINEERS, INC.
Farris Flexible Valve Corp.
Farval Corp., The
Flex—see Farris Flexible Valve
Corp.
FLEX-CHECK—SEE THE ALLEN-
SHERMAN-HOFF PUMP CO.
Flexible Valve Corp.
Foster Engineering Co.
General-American Valve Co.
Goodrich Co., B. F.
Grinnell Co., Inc.
Grinnell-Saunders—see Grinnell
Co., Inc.
HAZELTON—SEE BARRETT,
HAENTJENS & CO.
INFILCO, INC.
INTERNATIONAL B. F. GOOD-
RICH
KREBS—SEE EQUIPMENT EN-
GINEERS, INC.
Lead Lined Iron Pipe Co.
LEDEEN MFG. CO.
Lunkenheimer Co., The
Mag-Pneum-Power Trap—see Hanki-
son Corp.
MASSCO GRIGSBY—SEE MINE &
SMELTER SUPPLY CO., THE
Matheson Co., Inc., The
McNally Pittsburg Co.
MINE & SMELTER SUPPLY CO.
Minneapolis-Honeywell Regulator
Co., Industrial Div.
Ohio Brass Co.
Pacific Pipe Co.
Philadelphia Gear Wks., Inc.
Porter Co., Inc., H. K., WS Fit-
tings Div.
Rockwell Mfg. Co.
R-P&C Valve Div., American Chain
& Cable Co., Inc.
Super-Seal Flex—see Farris Flex-
ible Valve Corp.
United States Rubber Co.
Vitaalco Co. of America
Walworth Co.
Watts Regulator Co.
WESTERN PRECIPITATION
CORP.
Westinghouse Air Brake Co.,
Cleveland Rock Drill Div.
Westinghouse Air Brake Co.,
Industrial Products Div.

VENTILATION

EQUIPMENT AND

BLOWERS

BATTICE CLOTH AND TUBING
ABC—SEE AMERICAN BATTICE
CLOTH CORP.
AMERICAN BATTICE CLOTH
CORP.
Arizona Bag Co.
BEMIS BRO. BAG CO.
HANOVER INDUSTRIES, INC.
KOROSEAL—SEE INTERNA-
TIONAL B. F. GOODRICH

MINE FANS AND BLOWERS

Aerodyne—see Jeffrey Mfg. Co., The
American Air Filter Co., Inc.
American Blower Div. of American
Standard

**Manufacturer's Complete Names and Ad-
resses are listed in Section II, last pages
of this yellow section. Firms appearing in
boldface caps carry advertisements in
this issue.**

AXIVANE—SEE JOY MFG. CO.
Brownie—see Sanford-Day Iron Wks.

Carrier Corp.
Cleveland Worm & Gear Co., The
Coppus Engineering Corp.
DEMAG A.G.
Drucro—see Drullard Co., Howard

Drullard Co., Howard
GRAYBAR ELECTRIC CO., INC.
Homelite Corp.
INGERSOLL-RAND CO.
International Engr., Inc.
Jeffrey Mfg. Co.
JOY MFG. CO.
Koppers Co., Inc.
Mannesmann Export G.m.b.H.
MINE SAFETY APPLIANCE CO.
NORTHERN BLOWER CO.
Propellair—see Robbins & Myers, Inc.
Robbins & Myers, Inc.
Roots-Connerville Blower
Sanford-Day Iron Wks.
Standard Elec. Mfg. Co., Inc.
Stortbelt Corp.
Techn. Ind. en Handelsovernemings Toret Manufacturing Co.
Turbo-Maschinen A.G.
U. S. Hoffmann Machinery Corp.
Vano—see Coppus Eng. Co.
Ventair—see Coppus Eng. Co.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp., Sturtevant Div.

VENTILATION PIPE AND TUBING

ABC—SEE AMERICAN BRATTICE CLOTH CORP.

Amamaxir—see Cementation Co., Ltd.

AMERICAN BRATTICE CLOTH CORP.

Armco Drainage & Metal Products, Inc.

Ayrtube—see Flexible Tubing Corp.

BEMIS BROS. BAG CO.

Carrier Corp.

Cementation Co., Ltd., The

Colonial Plastics Mfg. Co., The

DeLaval Steam Turbine Co.

Drucro—see Drullard Co., Howard

Drullard Co., Howard

DU PONT DE NEMOURS & CO., INC., FABRICS DIV.

Fagerton Fabrikker A/S

Flexible Tubing Corp.

Goodrich Co., The B. F.

HANOVER INDUSTRIES, INC.

INTERNATIONAL B. F. GOOD-RICH

John-Manville Sales Corp.

MINE VENT—SEE AMERICAN BRATTICE CLOTH CORP.

NAYLOR PIPE CO.

NEOLON—SEE AMERICAN BRATTICE CLOTH CORP.

Spiratube—see Flexible Tubing Corp.

TELLURIDE IRON WKS.

Torit Manufacturing Co.

TRANSITE—SEE JOHNS-MANVILLE

Van-Cor—see Colonial Plastics Mfg. Co., The

VENTURE—SEE DU PONT DE NEMOURS & CO., INC., FABRICS DIV.

VIBRATORS

See Bins, Chutes and Accessories

WASHERS LOG

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

All-State Welding Alloys Co., Inc.

Bodinson Mfg. Co.

Conveyor Co., The

Davis Foundry & Machine Works

Eagle Iron Works

Georgia Iron Works Co.

Humboldt, Klockner-Humboldt-Deutz, A. G.

Iowa Mfg. Co.

Klockner-Humboldt-Deutz, A. G.

Knapp & Bates Ltd.

LAKE SHORE INC.

LINK-BELT CO.

Lippmann Engineering Works

McLANAHAN & STONE CO.

McNally Pittsburgh Co.

Pioneer Engineering Div., Poor & Co., Inc.

Smith Engineering Works

Universal Engr. Corp.

Washington Machinery Co.

Yuba Mfg. Co.

WELDING

EQUIPMENT,

SUPPLIES AND

SERVICES

EQUIPMENT

Abrasaweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.
American Chain & Cable Co., Inc.
Page Steel & Wire Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Auto Arc-Weld Mfg. Co.
Borrmann-Brenner-Berlin
Caterpillar Tractor Co.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus Sales Div.
HARNISCHFEGGER CORP.
Hobart Bros. Co.
Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.
International General Electric Co.
Jetweld—see Lincoln Electric Co.
Lincoln Electric Co.
Linde Air Prod. Co.
Mosebach Electric & Supply Co.
Motor Generator Corp.
Ohio Brass Co.
Oxi-Gasoline Cutting Torch—see Princeton Griphoist, Inc.
RANKIN MFG. CO.
Shield arc—see Lincoln Electric Co.
Smith Welding Equipment Corp.
TELLURIDE IRON WKS.
Tweco Prod., Inc.
Union Carbide and Carbon Corp.
Linde Air Products Company Div.
Victor Equipment Co.
Wall Colmonoy Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Willson-Weld—see Willson Prod., Inc.
Willson Prod., Inc.
Worthington Corp.

HARD FACING

Abrasaweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
All-State Welding Alloys Co., Inc.
AMERICAN BRAKE SHOE CO.
AMER. MANGANESE STEEL DIV.
Ampeco Metal, Inc.
AMPCO-Trode—see Ampeco Metal, Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Auto Arc Weld Mfg. Co., The
Chromo-Loy—see Resist-Loy Co.
Crucible Steel Co. of America
Deloro Stellite Ltd.
Eutectic Welding Alloys Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus Sales Div.
HARNISCHFEGGER CORP.
Hascrome—see Haynes Stellite Co.
Haynes Stellite Co.
Haystellite—see Haynes Stellite Co.
Hobart Bros. Co.
Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.
Isorod—see Resist-Loy Co.
Jetweld—see Lincoln Electric Co.
KENNAMETAL, INC.
Lincoln Electric Co.
Linde Air Products Co.
Manga-Tone, N-M—see Resist-Loy Co.
Manga-Kote—see Resist-Loy Co.
Motor Generator Corp.
Multimet—see Haynes Stellite Co.
RANITE—SEE RANKIN MFG. CO.

Resisto-Loy Co.
Rexweld—see Crucible Steel Co. of Amer.
Roll Matrix—see All-State Welding Alloys Co., Inc.
Sanford-Day Iron Works, Inc.
Seaco—see Stulz-Sickles Co.
Shieldarc—see Lincoln Electric Co.
STOODY CO.
Stulz-Sickles Co.
Taylor-Wharton Iron & Steel Co.
Union Carbide and Carbon Corp.
Haynes Stellite Co. Div.
Union Carbide and Carbon Corp.
Linde Air Products Co. Div.
Victor Equipment Co.
Wall Colmonoy Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

WELDING RODS

Abrasaweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
All-State Welding Alloys Co., Inc.
AMERICAN BRAKE SHOE CO.
AMERICAN MANGANESE STEEL DIV.
American Chain & Cable Co., Inc.
Page Steel & Wire Div.
AMPCO Metals, Inc.
AMPCO-Trode—see AMPCO Metal, Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bridgeport Brass Co.
Crucible Steel Co. of America
Eutectic Welding Alloys Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus Sales Div.
HARNISCHFEGGER CORP.
Haynes Stellite Co.
Hastelloy—see Haynes Stellite Co.
Hobart Bros. Co.
Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.
INTERNATIONAL GENERAL ELECTRIC CO.
Jetweld—see Lincoln Electric Co.
Linde Air Prod. Co.
Manganal—see Stulz-Sickles Co.
Motor Generator Corp.
Multimet—see Haynes Stellite Co.
Phos-Trode—see AMPCO Metal, Inc.
Resisto-Loy Co.
Revere Copper & Brass, Inc.
Resistal Stainless—see Crucible Steel Co. of Amer.
Shield Arc—see Lincoln Electric Co.
Steel Arc—see All-State Welding Alloys Co., Inc.
Stoody Co.
Stulz-Sickles Co.
Taylor-Wharton Iron & Steel Co.
Tweco-Lite Aluminum Welding Cable—see Tweco Products, Inc.
Tweco Products, Inc.
Union Carbide and Carbon Corp.
Linde Air Products Co. Div.
UNITED STATES STEEL EXPORT CO.
Victor Equipment Co.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

GENERAL SUPPLIES

Abrasaweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
All State Welding Alloys Co., Inc.
American Chain & Cable Co., Inc.
Page Steel & Wire Div.
American Optical Co.
Devcon Corp.
Devcon Plastic Steel—see Devcon Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus Sales Div.
Hobart Bros. Co.
Ideal Arc—see Lincoln Electric Co.
Industrial Air Products Co.
INTERNATIONAL GENERAL ELECTRIC CO.
Jetweld—see Lincoln Electric Co.

Lincoln Electric Co.
Linde Air Prod. Co.
MINE SAFETY APPLIANCES CO.
Motor Generator Co.
Shield Arc—see Lincoln Electric Co.
SIMPLEX WIRE & CABLE CO.
Smith Welding Equipment Corp.
Tweco Products, Inc.
Union Carbide and Carbon Corp.
Linde Air Products Co. Div.
Victor Equipment Co.
Westinghouse & Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

WELDMENTS, STEEL

Falk Corp., The

WINCHES

See also Hoisting Equipment

ELECTRIC

Beaumont—see International Combustion Ltd.
Beebe Bros.
Bodinson Mfg. Co.
Brownie—see Sanford-Day Iron Wks.
CHICAGO PNEUMATIC TOOL CO.
Clyde Iron Works, Inc.
DEMAG ARBEITSELSCHAFT Eisenhütten-Prinz Rudolph, A.G.
Hasenclever, Maschinenfabrik A.G.
HARNISCHFEGGER CORP.
INGERSOLL-RAND CO.
International Combustion Ltd.
JOY MFG. CO.
Kema (Köln-Ehrenfelder Maschinenbau-Anstalt)
LAKE SHORE, INC.
LEDEEN MFG. CO.
LINK-BELT CO.
Lug-All Co., The
MOBILE DRILLING, INC.
Ohio Hoist & Mfg. Co.
R & M—see Robbins & Myers, Inc.
Robbins & Myers, Inc.
Round Chain Cos.
Sanford-Day Iron Wks.
SAUERMAN BROS., INC.
Shepard Niles Crane & Hoist Corp.
STEPHENS-ADAMSON MFG. CO.
VULCAN-DENVER—SEE VULCAN IRON WORKS (DENVER)
VULCAN IRON WORKS (DENVER)
Western Gear Corp. (S. F.)
Westinghouse Electrical Corp.
Yale and Towne Mfg. Co.
Yuba Manufacturing Div. Yuba Consolidated Industries, Inc.

HAND

Beebe Bros.
Bodinson Mfg. Co.
Channon Corp., J. H.
Christian Engineers, J. D.
Clyde Iron Wks., Inc.
Coeur d'Alene Hardware & Foundry Co.
GRIPHOIST, INC.
HARNISCHFEGGER CORP.
LEDEEN MFG. CO.
LINK-BELT CO.
Lug-All Co.
Ohio Hoist & Mfg. Co.
Pacific Car & Foundry Co.
Princeton Griphoist, Inc.
Roberts & Schaefer Co.
Round Chain Cos.
SAUERMAN BROS., INC.
STEPHENS-ADAMSON MFG. CO.
Western Gear Corp. (S. F.)
Yale and Towne Mfg. Co.
Yuba Manufacturing Co.

WIRE

See Cable and Conduit

WIRE CLOTH

See Screens, Grizzlies, and Accessories

WIRE ROPE

See Rope, Wire

XANTHATES

See Reagents and Chemicals

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

SECTION II

Manufacturers' Index

Advertisers in Boldface

SECTION II contains an alphabetical list of the names and complete addresses of the principal manufacturers of specialized MINE-MILL-SMELTER

equipment. The names of manufacturers who are represented in this issue by catalogs or advertisements are printed in **BOLDFACE** type.

A

A & A Mfg. Co., Inc., 712 So. 12th Street, Milwaukee 4, Wisconsin
ABCs Scale Division, McDowell Co., Inc., 16360 Waterloo Road, Cleveland 10, Ohio
Asea, Vasteras, Sweden
Abrams Aerial Survey Corp., 606 East Shiawassee St., Lansing 1, Mich.
A.C.F. Industries, Inc., American Car & Foundry Div., 30 Church St., N.Y. 8, N.Y.
ACKER DRILL CO., INC., 725 W. LACKAWANA AVE., SCRANTON 3, PA.
Adamas Carbide Co., 121 Market St., Kenilworth, N.J.
Advance Car Cover Co., Inc., 112 N. Outagamie St., Appleton, Wis.
Aero Service Corp., 210 E. Courtland St., Phila. 30, Pa.
Aero Service Corp. (Midcontinent), 1401 S. Detroit St., Tulsa, Okla.
Aero Service Corp. (Western), 33 Richards St., Salt Lake City, Utah
African Surveys (Proprietary Ltd.), 44 Negget St., Johannesburg, U. of S. Africa
Agence Miniere & Maritime S. A., 2 Rue Van Bree, Anvers, Belgium
Ainsworth Wm. & Sons, Inc., 2151 Lawrence St., Denver 5, Colo.
Air Placement Equip. Co., 1009-11 W. 24th St., Kansas City 8, Mo.
Air Reduction Sales Co., 150 East 42nd St., New York 17, N.Y.
Alco Products, Inc., Schenectady 5, N.Y.
Alderman, Jr., Sidney S., 814 Newhouse Bldg., Salt Lake City 11, Utah
Aldon Companies, The, 3338 Ravenswood Ave., Chicago 13, Ill.
All-State Welding Alloys Co., Inc., 249-55 Ferris Ave., White Plains, New York
Allen & Garcia Co., 332 S. Michigan Ave., Chicago 4, Ill.
ALLEN-SHERMAN-HOFF PUMP CO., THE, 259 E. LANCASTER AVE., WYNNEWOOD, PA.
Alliance Machine Co., Alliance, Ohio
Allied Chemical & Dye Corp., Barrett Div., 40 Rector St., New York 6, N.Y.
Allied Chemical & Dye Corp., General Chemical Div., 40 Rector St., New York 6, N.Y.
Allied Geophysics, P.O. Box 583, San Jose, Calif.
Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, Ohio
Allied Witan Co., Inc., P.O. Box 2770, Cleveland, Ohio
Allis-Chalmers Mfg. Co., Buda Div., 1135 S. 70th St., Milwaukee 1, Wis.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP, MILWAUKEE 1, WIS.
Allis-Chalmers Mfg. Co., Construction Machy. Div., Box 512, Milwaukee 1, Wis.
Louis Allis Co., The, 427 E. Stewart St., Milwaukee 1, Wis.
ALLISON STEEL MFG. CO., P.O. BOX 6667, PHOENIX, ARIZ.
ALLOY STEEL & METALS CO., 1848 EAST 55TH ST., LOS ANGELES 58, CALIF.
Alphaduct Wire & Cable Co., P.O. Box 709, New Brunswick, N.J.
Alpine Laboratories, Ltd., 1610 South Nevada Ave., Colorado Springs, Colorado
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 1, Pa.
Amag-Hilpert-Pennitzhutte A.G., Werke Pegnitz, Nurnberg, Germany
Amercat Corp., 4809 Firestone Blvd., Southgate, Calif.
American Air Filter Co., 215 Central Ave., Louisville 8, Ky.
American Blower Div. of American Standard, Detroit 32, Mich.
AMERICAN BRAKE SHOE CO., 530 5TH AVE., NEW YORK 36, N.Y.
American Brake Shoe Co., Ramapo Ajax Div., Export Div., 230 Park Ave., New York 17, N.Y.
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV., 359 E. 14TH ST., CHICAGO HEIGHTS 9, ILL.
AMERICAN BRATTICE CLOTH CORP., 230 S. BUFFALO ST., WARSAW, IND.

American Chain & Cable Co., Page Steel & Wire Div., Monessen, Pa.
American Chain & Cable Co., Helicord Gage Div., Bridgeport 2, Conn.
American Chain & Cable Co., Inc., American Cable Div., York, Pa.
American Chain & Cable Co., Inc., American Chain Div., Princess & Charles Sts., York, Pa.
American Chain & Cable Co., Inc., Hazard Wire Rope Div., Wilkes-Barre, Pa.
American Chain & Cable Co., Inc., R-P&C Div., Reading, Pa.
American Chain & Cable Co., Inc., Wire Rope Div., 271 S. Pennsylvania Ave., Wilkes-Barre, Pa.
American Chain & Cable Co., Inc., Wright Hoist Div., York, Pa.
American Coldset Corp., 87-89 Court St., Paterson, N.J.
American Cyanamid Co., Explosive Dept., 30 Rockefeller Plaza, New York 20, N.Y.
AMERICAN CYANAMID CO., MINERAL DRESSING DEPT., 39 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.
American Forge Co., Niles, Calif.
American Hard Rubber Co., 93 Worth St., New York 13, N.Y.
American Hoist & Derrick Co., Crosby-Laughlin Div., 63 S. Robert St., St. Paul 1, Minn.
American LaFrance Corp., 148 E. LaFrance St., Elmira, New York
American Locomotive Co., 30 Church St., N.Y. 5, N.Y.
American M.A.N. Corp., 149 Broadway, New York 6, N.Y.
AMERICAN MINE DOOR CO., 2071 DUEBER AVE., S. W. CANTON 4, OHIO
American Optical Co., Southbridge, Mass.
AMERICAN POTASH & CHEMICAL CORP., 3030 W. 6TH ST., LOS ANGELES 54, CALIF.
American Rubber Mfg. Co., 1145 Park Ave., Oakland, Calif.
AMERICAN SMELTING & REFINING CO., 2250 S. STATE & MC CORMICK BLDG., SALT LAKE CITY, UTAH
American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif.
AMERICAN ZINC SALES CO., 1630 PAUL BROWN BLDG., ST. LOUIS, MO.
Ames Co., W. R., 1001 Dempsey Rd., Milpitas, Calif.
Ampco Metal, Inc., 1716 South 38th St., Milwaukee 46, Wis.
ANACONDA WIRE & CABLE CO., 25 BROADWAY, NEW YORK CITY 4, N.Y.
Analytical Measurements, Inc., 685 Main St., Chatham, N.J.
Andre Stihl Maschinenfabrik, Waiblingen, Newstadt/Wurt, Germany
Ansonia Wire & Cable Co., The, 11 Martin St., Ashton, Rhode Island
Apache Powder Co., Box 518, Benson, Arizona
Appleton-Atlas Car Mover Corp., 1421-25 S. 2nd St., Milwaukee 4, Wisconsin
Arizona Assay Office, 815 N. First St., Phoenix, Ariz.
Arizona Bag Co., 1502 So. 23rd Ave., Phoenix, Ariz.
ARIZONA TESTING LABORATORIES, 817 WEST MADISON ST., P.O. BOX 1888, PHOENIX, ARIZ.
Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio
Armco Steel Corp., 703 Curtis St., Middletown, Ohio
Armour Chemical Division, 1355 West 31st St., Chicago 9, Ill.
Armstrong-Bray & Co., 5366 Northwest Highway, Chicago 30, Ill.
ASEA ELECTRIC INC., 530 FIFTH AVE., N.Y.C. N.Y.—SEE ASEA
ASEA, VASTERAS, SWEDEN
Askania-Werke A.G., Berlin-Friedenau, Germany
Athey Products Corp., 5631 West 65th St., Chicago 38, Ill.
Atlantic Refining Co., The, 260 South Broad St., Philadelphia 5, Pa.
ATLAS C&M MFG. CO., 1140 IVANHOE RD., CLEVELAND 10, OHIO
ATLAS COPCO EASTERN, INC., P.O. BOX 2568, PATERSON 25, N.J.

ATLAS COPCO PACIFIC, INC., 930 BRITTAN AVE., SAN CARLOS, CALIF.
ATLAS COPCO, A. B. STOCKHOLM 1, SWEDEN
Atomic Engineering Corp., 424 S. 7th St., P.O. Box 1701, Grand Junction, Colo.
ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE
Augsburg-Nurnberg A. G., Maschinenfabrik (M.A.N.),—See American M.A.N. Corp.
August Thyssen-Hütte A. G., Franz-Leustraße 3, Duisburg-Hamborn, W. Germany
Autair, Ltd., 75 Wigmore Street, London W. 1, England
Auto Arc-Weld Mfg. Co., The, 9615 Meech Ave., Cleveland 5, Ohio
Autocar Trucks Division, White Motor Co., Canton, Ohio
AVELING-BARFORD, LTD., GRANTHAM, LINCOLNSHIRE, ENGLAND

B

B.I.F. Industries, Inc., 345 Harris St., Providence, R.I.
BABCOCK & WILCOX CO., BOILER DIV., THE, 161 EAST 42ND ST., NEW YORK 17, N.Y.
Badger Fire Extinguisher Co., Chase St., Methuen, Mass.
Bailey & Van Horn, Box 7, Murphy, N.C.
Baldwin-Lima-Hamilton Corp., 2232 Philadelphia Nat. Bank Bldg., Philadelphia 7, Pa.
Baldwin-Lima-Hamilton Corp., Eddystone Div., Philadelphia 42, Pa.
BALDWIN-LIMA-HAMILTON CORP., LIMA-HAMILTON DIV., PHILADELPHIA 42, PA.
Ban, L. Co., 24th & Dahlia, Denver 16, Colo.
Barber-Colman Co., 1300 Rock St., Rockford, Ill.
BARBER-GREENE CO., 400 NORTH HIGHLAND AVE., AURORA, ILLINOIS
Barco Mfg. Co., 600 Hough St., Barrington, Illinois
BARETT, HAENTJENS & CO., P.O. BOX 36, HAZLETON, PA.
Bartell, A.O., 308 Woodlark Bldg., Portland, Ore.
Bath Iron Wks. Corp., Rm. 1738, West Chester, Pa.
Baukol, Philip J., 2131 University Ave., Berkeley, Calif.
Bausch & Lomb Optical Co., 682 St. Paul St., Rochester, New York
Bavaria Maschinenfabrik, J. Hilber, Industriest/34 Neu-Ulm (Donau) Germany
Baxter, Ltd., W. H., 71 Gelderd Rd., Leeds 12, Yorkshire, England
Bay City Shovels, Inc., Bay City, Mich.
Bean Rubber Mfg. Co., 1623 So. 10th St., San Jose, Calif.
Becker-Prunte, GmbH, Datteln (Westfal) W. Germany
Beckman Instruments, Inc., Scientific Instruments Div., 2500 Fullerton Road, Fullerton, Calif.
Bedford & Sons, Ltd., John-Lion Works, Sheffield, Yorks, England
Beebe Bros., 2724 Sixth Ave., S. Seattle 4, Wash.
BELL HELICOPTER CORP., P.O. BOX 482, FT. WORTH 1, TEXAS
BEMIS BROS BAG CO., 408 PINE ST., BOX 23, ST. LOUIS 2, MO.
Bendelari, F.N., First National Bank, Joplin, Mo.
BENDIX AVIATION CORP., CINCINNATI DIV., 3130 WASSON RD., CINCINNATI 8, OHIO
Bennetts Chemical Laboratory, Inc., 991 S. Ninth Street, Tacoma 3, Wash.
Berger & Sons, Inc., C.L., 37 Williams St., Boston 19, Mass.
F. W. Berk & Co., Inc., 275 Brannan St., San Francisco 7, Calif.

Berk & Co., Inc., F.W., Park Place East
Wood Ridge, N.J.
Berman Chem. Co., 712 Superior St., Toledo
4, Ohio
**BETHLEHEM PACIFIC COAST STEEL
CORP., 20TH & ILLINOIS STREETS,
SAN FRANCISCO, CALIFORNIA**
Bethlehem Steel Co., Bethlehem, Pa.
Bethlehem Steel Export Corp., 25 Broadway,
N.Y. 4, N.Y.
Bico, Inc., 5116 Valhalla Drive, Burbank,
Calif.
Bin-Dicator Co., The, 13946 Kercheval Ave.,
Detroit 16, Mich.
Bird Machine Co., South Walpole, Mass.
Birdsboro Steel Foundry & Machine Co., Birds-
boro, Pa.
Bischoff-Werke KG, vorm. Pfingstmann-Werke,
Heilbrachstr. 84-86, Recklinghausen-Sud,
Germany
Bixby-Zimmer Engineering Co., 961 Abingdon
St., Galesburg, Ill.
**BLACK & DEASON, BOX 1888, SALT LAKE
CITY 1, UTAH**
**BLACK'S MINING EQUIPMENT, LTD., 167
MASON'S HILL, BROMLEY, KENT,
ENGLAND**
Black, Sivalis & Bryson, Inc., 7500 E. 12th St.,
Kansas City 26, Mo.
Blackburn International Corp., 149 Broadway,
New York 6, N.Y.
Blackhawk Mfg. Co., Milwaukee 46, Wis.
Blaw-Knox Co., Blaw-Knox Div., Farmers
Bank Bldg., Pittsburgh, Pa.
Bochumer Eisenhutte Heintzmann & Co.,
Bochum, Germany
Bodinson Mfg. Co., 2401 Bayshore Blvd., San
Francisco 24, Calif.
Bohrer, Geor. & Co., AG, Hansa-Allee 321,
Dusseldorf-Oberkassel, Germany
Bonded Scale & Machine Co., 69 Kingston,
Columbus, Ohio
Booklime, Incorporated, 3735 South 3100 East
St., Salt Lake City 9, Utah
**BOOTH CO., INC., THE, 333 W. 14TH ST.,
SALT LAKE CITY 4, UTAH**
Borg-Warner Ind.—see Morse Chain Co.,
N.Y.
Borrmann-Brenner-Berlin, Blucherstrasse 28,
Berlin S.W. 61, Germany
Borsig, AG, Berliner Str. 19-37, Berlin-Tegel
(Westaetkov), Germany
Boston Woven Hose & Rubber Co., P.O. Box
1071, Boston 3, Mass.
Bowdill Co., The, Boylan Ave., S. E. Canton,
Ohio
**BOYLES BROS. DRILLING CO., 1321 S.
MAIN ST., SALT LAKE CITY, UTAH**
**BOYLES BROS. DRILLING CO., LTD., 1275-
91 PARKER ST., VANCOUVER 6, B.C.,
CANADA**
Braun & Co., C. F., 1000 Fremont Avenue, Al-
hambra, Calif.
Braun Corp., 2260 E. 15th St., Los Angeles
21, Calif.
Braun-Knecht-Heiman Co., 1400 16th St., San
Francisco 19, Calif.
Bridgeport Brass Co., 30 Grand St., Bridge-
port, Conn.
Briggs & Stratton Corp., 2711 North Thir-
teenth St., Milwaukee 1, Wis.
Bristol Co., The, P.O. Box 1790 MW Water-
bury 20, Conn.
British Insulate Callender Cables, Ltd., Nor-
folk House, Norfolk St., London W.C. 2,
England
British Jeffrey-Diamond Ltd. Stennard Works,
Wakefield, Yorks, England
British Ropes Ltd., Doncaster, Yorkshire (Eng-
land)
British Ropes Ltd., Export Sales Div., 52 High
Holborn, London, England
British Ropeway Engineering Co., Ltd., Plan-
tation House, Mincing Lane, London E.C.,
England
Broadbent & Son, Ltd., Robert Phoenix Iron-
works, Stalybridge, England
Broderick & Bascom Rope Co., 4203 Union
Blvd., St. Louis 15, Missouri
**BROWN INC., DAVID, 999 BEECHER ST.,
SAN LEANDRO, CALIF.**
Brown, Industries, David, Meltham, Hudders-
field, England
Brown Boverie & Cie. AG, Mannheim, Ger-
many
**BRUNNER & LAY, INC., 9300 KING ST.,
FRANKLIN PARK, ILL.**
Buck & Associates, Carl, Essex Falls, N.J.
**BUCCYRUS-ERIE CO., P.O. BOX 56, SOUTH
MILWAUKEE, WIS.**
Buda Co., (Div. of Allis-Chalmers Mfg. Co.),
Harvey, Ill.
Buell Engineering Co., Inc., 70 Pine St., New
York 6, New York
Bullard Co., E. D., 2680 Bridgeway, Sausalito,
Calif.
**BUNKER HILL & SULLIVAN MINING &
CONCENTRATING CO., BOX 29, KEL-
LOGG, IDAHO**
Butler Mfg. Co., 7400 E. 13th St., Kansas
City 26, Mo.
Byron Jackson Pumps, Inc., P.O. Box 2017A,
Terminal Annex, Los Angeles, Calif.

C

C & D Batteries, Inc., Conahohocken, Pa.
C M G Industries Inc., 615 S. 2nd St., Lara-
mie, Wyo.
California Texas Oil Co., Ltd., 380 Madison
Ave., New York, N.Y.
Calumet & Hecla, Inc., Calumet Div., 1 Calu-
met Ave., Calumet, Mich.
Campbell Chain Co.
Canada Wire & Cable Co., Ltd., P. S. "R,"
Toronto 17, Ontario, Canada
Canadian Aero Service Ltd., 348 Queen St.,
Ottawa 4, Ontario, Canada
Canadian Safety Fuse Co. Ltd., Brownburg,
Quebec, Canada
Canton Mfg. Co., 2408 13th St., N. E., Canton
5, Ohio
Carborundum Co., The, Refractories Div.,
Perth Amboy, N.J.
**CARD IRON WORKS CO., THE C. S., P.O.
BOX 117, DENVER 1, COLO.**
Cardox Corp., 307 N. Michigan Ave., Chicago,
Ill.
Carey, Philip, Mfg. Co., Wayne Ave. At
Cooper, Cincinnati, Ohio
Carroll Products Corp., 10225 Meech Ave.,
Cleveland 5, Ohio
Carlyle Rubber Co., Inc., 103-107 Warren St.,
New York 7, N.Y.
Carol Cable Co., 190 Middle St., Pawtucket,
Rhode Island
Carpcop Mfg. Inc., P.O. Box 3272, Jacksonville
5, Fla.
Carrier Corp., 300 So. Geddes St., Syracuse,
N.Y.
Carrier Conveyor Corp., 211 N. Jackson St.,
Louisville, Ky.
Caterpillar Tractor Co., Peoria, Illinois
Cecil S. A., P.O. Box 241, Luxemborg
CEMENT GUN CO., ALLENTOWN, PA.
Cementation Co., Ltd.—The, Bentley Works,
Doncaster. Head office: 20 Albert Embank-
ment, London SE 11.
Central Frog & Switch Co., The, Box 95, Sta.
O, Cincinnati 8, Ohio
Central Mine Equipment Co., 6200 N. Broad-
way, St. Louis 16, Mo.
Central Scientific Co. of California, 1040 Mar-
tin Ave., Santa Clara, Calif.
Centrifugal & Mechanical Industries, Inc., 146
President St., St. Louis 18, Mo.
Cesalpinia s.p.a., Via Felice-Casati 44, Milan,
Italy
Chain Belt Co., 4701 West Greenfield Ave.,
Milwaukee 6, Wis.
Chain Belt Co., Shafer Bearing Div., Downers
Grove, Illinois
Channon Corp., J. H., 1447-55 West Hubbard
St., Chicago 22, Ill.
**CHAPMAN & WOOD, 536 JEFFERSON ST.,
N. E. ALBUQUERQUE, NEW MEX.**
Chapman Dyer Steel Co., 820 S. Euclid, Tuc-
son, Ariz.
Charlton Laboratories, 2340 S. W. Jefferson
St., Portland 7, Ore.
Chase Brass & Copper Co., 236 Grand St.,
Waterbury 20, Conn.
Chester Hoist—see National Screw & Mfg. Co.
Chicago Eye Shield Co., 2727 W. Roscoe St.,
Chicago 18, Ill.
**CHICAGO PNEUMATIC TOOL CO., 8 EAST
44TH ST., NEW YORK, N.Y.**
**CHIKSAN CO., 330 N. POMONA AVE.,
BREA, CALIF.**
**CHRISTENSEN DIAMOND PRODUCTS
CO., 1937 S 2ND WEST P.O. 387, SALT
LAKE CITY, UTAH**
Chrysler Corp.—Dodge Div., 21500 Mound
Road, Detroit 31, Mich.
Circle Wire & Cable Corp., 5500 Maspeth Ave.,
N. Maspeth, N.Y.
**CLARK EQUIPMENT CO., CONSTRUCTION
MACHINERY DIV., P.O. BOX 599, PIPE-
STONE PLANT BENTON HARBOR,
MICH.**
Clarkson Co., The, 564 Market St., San Fran-
cisco 4, Calif.
Cleveland Rock Drill Div., Westinghouse Air
Brake Co., Cleveland, Ohio
Cleveland Vibrator Co., The, 2828 Clinton
Ave., Cleveland 13, Ohio
Cleveland Wire Cloth & Mfg. Co., 3573 E.
78th St., Cleveland 6, Ohio
Cleveland Worm & Gear Co., The, 3249 East
80th St., Cleveland 4, Ohio
Climax Molybdenum Co., 500 Fifth Ave., N.Y.
36, N.Y.
Climax Rock Drill & Engineering Works, Ltd.,
4, Broad St. Place, London, E.C.2, Eng-
land
Clipper Belt Lacer Co., 974 Front Ave., N.W.,
Grand Rapids 2, Mich.
Clyde Iron Works, Inc., Duluth 1, Minnesota
**COAST MFG. & SUPPLY CO., BOX 71,
LIVERMORE, CALIF.**
Coeur d'Alene Hardware & Foundry Co., Box
969, Wallace, Idaho
Coffing Hoist Div., Duff Norton Co., Danville,
Ill.

**COLEMAN CABLE & WIRE CO., 3919 WES-
LEY TERRACE SCHILLER PARK, ILL.**
Collyer Insulated Wire Co., 245 Roosevelt
Ave., Pawtucket, R.I.
Colonial Plastics Mfg. Co., 2685 E. 79th St.,
Cleveland 4, Ohio
**COLORADO ASSAYING CO., THE, 2013
WELTON ST., DENVER 1, COLO.**
**COLORADO FUEL & IRON CORP., P.O.
BOX 1929, DENVER, COLO.**
**COLORADO IRON WORKS CO., 3300 RACE
ST., DENVER 5, COLO.**
**COLUMBIA STEEL CASTING CO., INC.,
933 N. W. JOHNSON ST., PORTLAND 9,
ORE.**
**COLUMBIAN STEEL TANK CO., 1509 WEST
12TH ST., KANSAS CITY 1, MO.**
Combustion Engineering Inc., Raymond Div.,
1315 N. Branch St., Chicago 22, Ill.
Combustion Engineering, Inc., 200 Madison
Ave., New York 16, New York
Commercial Shearing & Stamping Co., 1775
Logan Ave., Youngstown 1, Ohio
Connecticut Telephone & Electric Corp.,
Meriden, Conn.
**CONNELLSVILLE MFG. & MINE SUPPLY
CO., S. 4TH ST., CONNELLSVILLE, PA.**
Conrad-Stork, P.O. Box 134, Haarlem, Holland
Consolidated Pneumatic Tool Co. Ltd., 232
Lancaster Rd., London, S. W., England
Construction Mach. Co., Box 120, Waterloo,
Iowa
Continental Gin Co., 4600-5th Ave., South,
Birmingham, Ala.
Continental Motors Corp., 205 Market St.,
Muskegon, Mich.
Convair Inc., P.O. Box 9671, Pittsburgh 26,
Pa.
Conveyor Co., The, 3260 East Slauson Ave.,
Los Angeles 58, Calif.
Cooper-Bessemer Corp., The, Mount Vernon,
Ohio
Coppus Engineering Corp., 344 Park Ave.,
Worcester 10, Mass.
**COWIN & CO., INC., 1-18TH ST. S.W., BIR-
MINGHAM, ALA.**
Craig Carroll Co., 66 S.E. Belmont, (Box
2208), Portland 14, Oregon
Crane Co., 836 S. Michigan Ave., Chicago 6,
Ill.
Crescent Belt Fastener Co., 480 Lexington
Ave., New York 17, N.Y.
Crown Zellerbach Corp., 343 Sansome St., San
Francisco 19, Calif.
**CROWN ZELLERBACH CORP., 343 SAN-
SOME ST., SAN FRANCISCO 19, CALIF.**
Crucible Steel Co. of America, Henry W.
Oliver Bldg., Mellon Square, P.O. Box 88,
Pittsburgh 30, Pa.
Crusher Eng. Div., Poor & Co., 400 Archi-
tects Bldg., Philadelphia 3, Pa.
Cummins Engine Co., Inc., Fifth & Union
St., Columbus, Ind.
Custom Assay Office, Box 811, El Paso, Texas
Custom Products Co., P.O. Box 790, Carson
City, Nevada
Cutler-Hammer, Inc., 315 N. 12th St., Mil-
waukee 1, Wis.

D

Dagenhardt-Utsch KG, Eisern (KR-Siegen)
Germany
**DALE, WADE M., 238 E. POLK ST., COAL-
INGA, CALIF.**
Davey Compressor Co., Kento, Ohio
Davis & Davis, 2532 Lambourne Ave., Salt
Lake City, Utah
Davis Foundry & Machine Works, Rome, Ga.
Dayton Rubber Co., Woodside Bldg., Green-
ville, S. C.
Dean Bros. Pumps, Inc., 323 West 10th St.,
Indianapolis 7, Indiana
Denson & Nichols, 160 South West Temple
St., Salt Lake City 1, Utah
**DEGENDOERFER, T. G., BOX 840, KEL-
LOGG, IDAHO**
**DEISTER CONCENTRATOR CO., 925 GLAS-
GOW AVE., FORT WAYNE, IND.**
Delstar Machine Co., 1933 E Wayne St., Ft.
Wayne 4, Ind.
Deloro Stellite Ltd., Highlands Rd., Shirley,
Solihull, Warwickshire, England
Deming Co., Salem, Ohio
**DENVER EQUIPMENT CO., Box 5268 (1400-
17TH ST.), DENVER 17, COLO.**
**DENVER FIRE CLAY CO., 2301 BLAKE ST.,
P.O. BOX 5510, DENVER 17, COLORADO**
Detection Corp., 5528 Vineland Ave., North
Hollywood, Calif.
DeLaval Steam Turbine Co., 300 Nottingham
Way, Trenton 2, N. J.
**DEMAG AKTIENGESSELLSCHAFT, WOLF-
GANG-REUTER-PLATZ, DUISBURG,
GERMANY**
Demag, Electrometallurgie GmbH, Wolfgang-
Reuter-Platz, Duisburg, Germany
De Sousa & Co., J. E., Inc., 217 Broadway,
New York, N.Y.
Devcon Corp., Danvers, Mass.
**DIAMOND DRILL CONTRACTING CO.,
SOUTH 18 STONE ST., P.O. BOX 4063,
STATION B, SPOKANE, WASHING-
TON**

Diamond Iron Works Div., Goodman Mfg. Co., Halsted St., Chicago 9, Ill.
DIAMOND TOOL RESEARCH CO., INC., 330 2ND AVE., N.Y. 10, N.Y.
 Diamond Chain Co., Inc., 402 Kentucky Ave., Indianapolis, Ind.
 Dicalite Div., Great Lakes Carbon Corp.
DICKINSON LABORATORIES, 1300 W. MAIN ST., BOX 16, EL PASO, TEXAS
DIESEL ENERGY CORP., 42 BEAVER ST., NEW YORK, N.Y.—SEE KLOCKNER-HUMBOLDT-DEUTZ
 Dietzgen Co., Eugene, 2425 North Sheffield, Chicago, Ill.
 Differential Steel Car Co., Findlay, Ohio
 Dings Magnetic Separator Co., 4740 West Electric Ave., Milwaukee 46, Wis.
 Dodge Mfg. Corp., S. Union St., Mishawaka, Ind.
 Doimar Machine Fabrik, Kedenburg Strasse 53-59 Hamburg Wandsbeck, Germany
 Dorman & Co. Ltd., W.H.-Tisall Road Works, Stafford, England
DORR-OLIVER, HARRY PLACE, STAMFORD, CONN.
 Dorr Oliver GmbH, Gustav-Freytag Strasse 9, Weisbaden, Germany
DOW CHEMICAL CO., THE, MIDLAND, MICH.
DRAVO CORP., NEVILLE ISLAND, PITTSBURGH 25, PA.
 Drilling Accessory & Mfg. Co., Inc., P. O. Box 5768, 2006 S. Industrial, Dallas, Texas
 Drott Mfg. Corp., 3841 W. Wisconsin Ave., Milwaukee 8, Wis.
 Drullard Co., Howard, 1026 Folsom St., San Francisco 3, Calif.
 Ducon Co., 152 E. 2nd St., Mincola, N.Y.
 Duff-Norton Co. of Pittsburgh, Pa.
 Du Mont Laboratories, Inc., Allen B., 750 Bloomfield Ave., Clifton, New Jersey
 Dunkin Blue Print & Supply Co., Box 1400, Grand Junction, Colo.
 duPont de Nemours & Co., E. I. Chemicals Dept., duPont Bldg., Wilmington, Del.
DUPONT DE NEMOURS & CO., INC., EXPLOSIVES DIV., WILMINGTON 98, DELAWARE
 DuPont de Nemours & Co., Inc., Fabrics Div., Newburgh, N.Y.
DUNHAM MFG. & SALES CO., GORDON S., 852 MISSION ST., SO. PASADENA, CALIF.
 Dunlop Rubber Co., Ltd., 10/12 King St., St. James, London, S.W.1, England
 Duriron Co., Inc., The, P.O. Box 1019, Dayton 1, Ohio
 Dusterloh, G. Fabrik fur Bergwerksbedarf GmbH, Hauptstrasse 70, Sprockhovel (Westf.), Germany
 Dwight-Lloyd Div., McDowell Co., Inc., The Dynamic Div., Eaton Mfg. Co., 3307-14th Ave., Kenosha, Wisconsin

E

Eagle Crusher Co., Galion, Ohio
 Eagle Iron Works, 261 Holcomb Ave., Des Moines, Iowa
EAKLAND & OSTERSTOCK, 700 NEWHOUSE BLDG., SALT LAKE CITY, UTAH
 Earle, Norton K., 1116½ N. Western Ave., Los Angeles 29, Calif.
 Easton Car & Construction Co., Easton, Pa.
 Eaton Manufacturing Co., Dynamic Div., 3307-14th Ave., Kenosha, Wisconsin
 Eberhard Bauer GmbH, Esslingen Neckar, W. Germany
EBERLINE INSTRUMENT CORP., P.O. BOX 279, SANTA FE, NEW MEXICO
 Economy Fuse & Mfg. Co., Greenville Ave. at Diversey Pkwy., Chicago, Ill.
 Edison, Inc., Thomas A., Edison Storage Battery Div., West Orange, N.J.
 Edwards Co., E. H., P.O. Box 513, South San Francisco, Calif.
 Edwards Co., Inc., Post Road, Norwalk, Conn.
 Eichhoff, Gebr. Maschinenfabrik u. Eisengieserei GmbH, Bochum, Germany
 Elmco Corp., 254 S. 4th West St., Salt Lake City 10, Utah
 Eisenhutte Prinz Rudolph, A.G., Dulman/Westf., Germany
 Eisenwerke Mulheim/Meiderich A.G., (22a) Mulheim-Ruhr Postfach 420, Germany
 Electric Controller & Mfg. Co., 4514 Lee Road, Cleveland 28, Ohio
 Electric Machinery Mfg. Co., 800 Central Ave., Minneapolis 13, Minn.
ELECTRIC STEEL FOUNDRY CO., 2141 NW 25TH AVE., PORTLAND 10, ORE.
 Electric Storage Battery Co., Exide Industrial Division, 42 South 15th Street, Philadelphia 2, Pa.
 Electro Technical Labs Div., Mandrel Industries, 504 Waugh Dr., Houston, Texas
 Elektrokemiak A. S., 101 Park Ave., New York 17, N.Y.
ELLIOT, D. H., P.O. BOX 1007, CASPER, WYO.
 Elreco Corp., 2900 Cornany Ave., Cincinnati 26, Ohio

El Paso Testing Laboratories, El Paso, Tex.
 El-Tronics, Inc., Mayfield, Pa.
 Engineers Syndicate, Ltd., 5011 Hollywood Blvd., Hollywood 27, Calif.
 English Electric Export & Trading Co., Ltd., Stafford, England
 Ensign-Bickford Co., Hopmeadow St., Simsbury, Conn.
 Enterprise Eng. & Mach. Co., 18th & Florida St., S.F. 10, Calif.
 Equipment Engineering Co., 9100 S. 150 E. Sandy, Utah
EQUIPMENT ENGINEERS INC., 41 SUTTER ST., SAN FRANCISCO 4, CALIF.
 Erbo Maschinenbau, Erley & Bonninger, Bahnhofstrasse 268, Haslinghausen, Germany
 Erie Pump & Engine Works, 165 Glenwood Ave., Medina, N.Y.
 Eries Mfg. Co., 258 Magnet Drive, Erie, Pa.
 Esch-Werke K.G., Duisberg, West Germany
ESCO INTERNATIONAL, GRAYBAR BLDG., 2519 LEXINGTON AVE., NEW YORK 17, N.Y.
 Esser Wire Corp., 1601 Wall Street, Fort Wayne 6, Ind.
 Esso Standard Oil Co., 15 West 51st St., New York 10, N.Y.
 Enterline-Angus Co., Inc., P.O. Box 594, Indianapolis 6, Ind.
EUCLID DIVISION, SEE GENERAL MOTORS
 Euclid Electric & Mfg. Co., 50 Edwards St., Madison, Ohio
 Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N.Y.
 Exolon Co., The, Tonawanda, N.Y.
 Exploration Drilling Co., P.O. Box 1161, Bakersfield, Calif.

F

Fa. Ten Pas & Co., 140 Zeglis, Alkmaar, Netherlands
 Fagersta AB, Fagersta, Sweden
 Fagerun Fabrikker, A/S, P.O. Box 22, Drammen, Norway
 Failing Co., Geo. E., 424 E. Broadway, Enid, Oklahoma
 Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
 Fairchild Aerial Surveys, Inc., 224 E. 11th St., Los Angeles, Calif.
 Falk Corp., The, 3004 W. Canal St., Milwaukee 1, Wis.
 Farberwerke Hoechst AG., Frankfurt (M)-Hoechst, West Germany
 Farrel-Birmingham Co., Inc., Ansonia, Conn.
 Farris Flexible Valve Corp., 400 Commercial Ave., Palisades Park, N.J.
 Farval Corp., The, 3249 E. 80th St., Cleveland, Ohio
FATE-ROOT-HEATH CO., THE, PLYMOUTH LOCOMOTIVE WKS. DIV., PLYMOUTH, OHIO
 Federal Motor Truck Co., 5780 Federal Ave., Detroit 9, Mich.
FEDERAL PIPE & TANK CO., 6851 EAST MARGINAL WAY, SEATTLE 8, WASH.
 Filter Fabrics, Inc., 1279 W. 3rd St., Cleveland 13, Ohio
 Filtration Engineers Div., American Machine & Metals, Inc., East Moline, Illinois
 Firestone Tire & Rubber Co., 1200 Firestone Pkwy., Akron 17, Ohio
 Firth Sterling Inc., 3113 Forbes St., Pittsburgh 30, Pa.
 Fischer & Porter Co., 215 Warminster Rd., Halthorpe, Pa.
 Fisher Contracting Co., P.O. Box 6306, Phoenix, Ariz.
 Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif.
 Fiske Brothers Refining Co., Lubriplate Div., 129 Lockwood St., Newark 5, N.J.
 Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.
 Flexible Tubing Corp., Guilford, Conn.
 Flexible Valve Corp., 400 Commercial Ave., Palisades Park, N.J.
 Flottman-Werke GmbH, Herne, Westf. West Germany
 Fluidwick Co., 5319 E. Outer Dr., Detroit 34, Mich.
 Fluor Hartmann Div., Fluor Prods. Co., 1200 Washington Blvd., Whittier, Calif.
 Food Machinery & Chem. Corp., John Reas Div., P.O. Box 145, San Jose 3, Calif.
 Fodens Ltd., Sandbach, Cheshire, England
 Food Machinery & Chemical Corp., Peerless Pump Div., 301 West Avenue 26, Los Angeles, Calif.
 Foster Engineering Co., 835 Lehigh Ave., Union, N. J.
 Foster Wheeler Corp., 165 Broadway, New York 6, N.Y.

Four Wheel Drive Auto Co., 12th Street, Clintonville, Wis.
 Foxboro Co., Foxboro, Mass.
 Fraser & Chalmers Engr. Wks., Fraser Rd., Erith, Kent, England
FREDERICK, FRANCIS H., 699 MARKET ST., SAN FRANCISCO 4, CALIF.
 Frolic & Klupfel, Wuppertal-Barmen, W. Germany
 Fruehauf Trailer Co., 10940 Harper Ave., Detroit 32, Mich.

G

Galigher Co., 545 West 8th South St., P.O. Box 209, Salt Lake City 10, Utah
 Gallon Allsteel Body Co., S. Market St., Gallon, Ohio
 Gardner, E. D., 200 N. Wayne St., Arlington, Virginia
GARDNER-DENVER CO., FRONT ST., QUINCY, ILL.
 Garlock Packing Co., Palmyra, New York
 Gar Wood Industries, Inc., Wayne, Mich.
 Gates Rubber Co., 999 S. Broadway, Denver, 17, Colo.
 Gatke Corp., 228 N. LaSalle St., Chicago 1, Ill.
 General American Transportation Corp., 134 S. LaSalle St., Chicago 90, Ill.
 General-American Valve Co., P.O. Box 444, Corona Del Mar, Calif.
 General Aniline & Film Corp., Ozalid Div., 101 Anso Road, Johnson City, N.Y.
GENERAL CABLE CORP., 420 LEXINGTON AVE., NEW YORK, N.Y.
 General Detroit Corp., 110 Mt. Elliott, Detroit, Mich.
 General Dynamics Corp., Electro Dynamic Div., Avenue A, Bayonne, New Jersey
 General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, New York
 General Electric Co., Plainville, Conn.
 General Electric Co., Carboly Dept., Box 237, Roosevelt Park Place, Detroit 32, Mich.
 General Electric Co., Construction Materials Division, 1255 Boston Ave., Bridgeport 2, Conn.
GENERAL ELECTRIC CO., INTERNATIONAL, 150 EAST 42ND ST., NEW YORK 17, N.Y.
 General Electric Co., Lamp Dept., Nela Park, E. Cleveland 12, Ohio
 General Electric Co., Metallurgical Products Dept., 11177 E. 8 Mile Rd., Detroit 32, Mich.
 General Electric Co. of England, Ltd., The Fraser & Chalmers Eng. Works, Erith, Kent, England
 General Equipment Co., Box 134, Owatonna, Minnesota
 General Fire Extinguisher Corp., 25631 Little Mack, St. Clair Shores, Mich.
GENERAL HARDWOOD CO., MILWAUKEE WATERWAY AT E. 11 ST., TACOMA, WASH.
 General Machinery Co., 3500 Riverside Ave., Spokane, Wash.
 General Metals Corp., Enterprise Engine & Machinery Co., 18th & Florida Streets, San Francisco 10, Calif.
 General Mills, Inc., Chemical Div., Kankakee, Ill.
 General Mills, Inc., Special Commodities Div., 400 Second Ave. South, Minneapolis 1, Minn.
 General Motors Corp., Allison Div., P.O. Box 894, Indianapolis, Ind.
 General Motors Corp., Delco Products Div., 329 E. First St., Dayton, Ohio
 General Motors Corp., Detroit Diesel Engine Div., 13400 W. Otter Drive, Detroit 28, Mich.
 General Motors Corp., Electro-Motive Div., La Grange, Ill.
GENERAL MOTORS CORP., EUCLID DIV., 1361 CHARDON RD., CLEVELAND 17, OHIO
 General Motors Corp., GMC Truck & Coach Div., 660 S. Blvd., E. Pontiac 11, Mich.
 General Motors Corp., 269 N. Main St., New Departure Div., Bristol, Conn.
GENERAL MOTORS OVERSEAS OPERATION, 1775 BROADWAY, NEW YORK 19, N.Y.
 General Petroleum Corp., 612 S. Flower St., Los Angeles, Calif.
 General Refractories Co., 1520 Locust St., Philadelphia 2, Pa.
 General Tire & Rubber Co., Akron 1, Ohio
 Geodynamics, Inc., 60 South Craig Ave., Pasadena, Calif.
 Geo-Engr., 304 Main St., Grand Junction, Colo.
 Geo-Optic Co., Inc., 170 Broadway, New York 38, N.Y.
 Geophysical Services, Inc., 5900 Lemmon St., Dallas 9, Texas
 Geophysical Specialties Co., 4206 Longfellow Ave., Minneapolis 7, Minn.
 Geoprosessional Services, Inc., 65 E. 4th St. S., Salt Lake City 11, Utah
 Georgia Iron Works Co., 605-12th Street, Augusta, Ga.
 Gesellschaft fur Werberberatung und Wirtschaftswerbung MBH, Steinstrasse 27, Dusseldorf, Germany

GETMAN BROS. MFG. DIV. INC., DUNKLEY AVE., SOUTH HAVEN, MICH.
Gibson, W. W., 1015 Fruitvale Ave., Oakland 1, Calif.

Gilbreath Chemical Co., 283 Brannan St., San Francisco, Calif.
GODOY & CO., INC., E. A. CUNARD BLDG., 25 BROADWAY, NEW YORK 4, N.Y.
Goldak Co., 1644 W. Glenoaks Blvd., Glendale 1, Calif.

GODDALL BROS., BOX 537, 46 S. MAIN ST., HELENA, MONTANA

GODDALL RUBBER CO., 430 WHITEHEAD ROAD, TRENTON, N.J.

GOODMAN MFG. CO., HALSTED ST. & 48TH PL., CHICAGO 9, ILL.

GOODRICH CO. B. F., INTERNATIONAL INDUSTRIAL PROD. DIV., 500 S. MAIN ST., AKRON, OHIO

Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio

Gottwald, Leo, Werftstrasse, Dusseldorf, Germany

GOULD & CO., GORDON I., 58 SUTTER ST., SAN FRANCISCO 4, CALIF.

Gould-National Batteries, Inc., Trenton 7, New Jersey

Granby Cons. Mining Smelting & Power Co., Ltd., Corner Mt. British Columbia, Canada

GRAYBAR ELECTRIC CO., INC., 420 LEXINGTON AVE., NEW YORK 17, N.Y.

GREENSBURG MACHINE CO., STANTON ST., GREENSBURG, PA.

Gregg Co., Ltd., The, 19 Rector St., New York 6, N.Y.

Grinnell Co., Inc., 260 West Exchange St., Providence, R. I.

Gripshoist Inc., 424 Bryant St., S.F. 7, Calif.

Grundler Crusher & Pulverizer Co., 2917 N. Market St., St. Louis, Mo.

Gulf Oil Corp.—Gulf Refining Co., 1822 Gulf Bldg., P.O. Box 1166, Pittsburgh 30, Pa.

Gundlach Machine Co., Div., T. J., J. M. J. Industries, Inc., 226 Centerville Ave., Belleville, Ill.

Gurley, W. & L. E., 514 Fulton St., Troy, N.Y.

Guston-Bacon Mfg. Co., 210 W. 10th St., Kansas City, Mo.

Gutehoffnungshutte A.G., Oberhausen-Sterkrade, W. Germany

H

HACK ENGINEERING CO., 124 WAZEE MARKET, DENVER, COLO.

HADFIELD LTD., EAST HECLA WORKS, SHEFFIELD 9, ENGLAND

Haise Mfg. Co., Inc., Geo., 350 5th Ave., N.Y. 1, N.Y.

Hall-Scott Motors, Inc., 2850-7th St., Berkeley, Calif.

Hammond Bag & Paper Co., Wellsburg, W. Va.

Hankinson Corp., College & Pike, Canonaburg, Pa.

Hanks, Inc., Abbott A., 624 Sacramento St., San Francisco 11, Calif.

HANOVER INDUSTRIES, INC., 77 VETERAN ST., MERIDEN, CONN.

Harbison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.

HARDINGE CO., INC., 240 ARCH ST., YORK, PA.

HARNISCHFEGGER CORP., 4400 W. NATIONAL AVE., MILWAUKEE 46, WIS.

HARNISCHFEGGER EXPORT CORP., SEE HARNISCHFEGGER CORP.

Harnischfeger Int'l Corp., GmbH, Allestrasse 35, Dusseldorf, Germany

Hartmann, Maschinenfabrik AG, Waldstrasse 220, Offenbach-Main, Germany

Haenschler, Maschinenfabrik, AG, Witzschstrasse 55, Dusseldorf, Germany

Hauscherr, Rudolf & Son, Maschinenfabrik, Albfelderstrasse 53, Sprockhovel (Westf.), Germany

Havlick, J. L., 112 S. Cedar St., Spokane, Wash.

Hawley & Hawley, Box 1060, Douglas, Ariz.

HAWTHORNE, HERB J. INC., P.O. BOX 7366, HOUSTON 8, TEXAS

Haynes Stellite Co., Div. of Union Carbide Corp., 725 S. Lindsay St., Kokomo, Ind.

Hazard Insulated Wire Wks., Okonite Co., Passaic, N.J.

Hazen, H. L., H. L. Hazen, Inc., Farmers Union Bldg., Denver, Colo.

Hazemag of Germany, P.O. Box 576, Munster (Westfalen), Germany

Hazemag USA, Inc., 122 E. 42nd St., New York 17, N.Y.

HEAD WRIGHTSON, STOCKTON FORGE LTD., NORTON ROAD, STOCKTON-ON-TEES, ENGLAND

Heil Co., 3000 W. Montana St., Milwaukee 1, Wis.

Hemseid, Hermann Maschinenfabrik, Borsberg 97-103, Wuppertal, W. Germany

Hendrick Mfg. Co., Carbondale, Pa.

Hensley Equip. Co., 800 Peralta Ave., San Leandro, Calif.

Hercules Motors Corp., 101 11th St., S.M., Canton 2, Ohio

Hercules Powder Co., 900 Market St., Wilmington, Del.

Hercules Steel Products Co., Sherman St., Gallon, Ohio

Hevi Duty Electric Co., 4212 W. Highland Blvd., Milwaukee 1, Wis.

HEWITT-ROBINS INC., 666 GLENBROOK RD., STAMFORD, CONN.

Hewitt-Robins Inc., Hewitt Rubber Div., 240 Kensington Ave., Buffalo 5, N.Y.

Hewitt-Robins Inc., Wire Products Plant, Henderson Rd. & Queen's Dr., King of Prussia, Pa. (Formerly: Korb Pettit, Inc.)

Heyl & Patterson, Inc., 55 Fort Pitt Blvd., Pittsburgh 22, Pa.

Hillman Co., C. Kirk, 3201 First Ave. South, Seattle 4, Wash.

Hirsch Bros. Machy. Co., P.O. Box 226, El Paso, Tex.

Hitchcock Mfg. Co., Leo, 12015 Wicks St., Sun Valley, Calif.

Hobart Bros. Co., Hobart Sq., Troy, Ohio

Hockensmith Corp., The Penn, Pennsylvania

Hoffman Bros. Drilling Co., 120 E. Mahoning St., Punxsutawney, Pa.

Holman Bros. (Canada) Ltd., Kent Ave., Kitchener, Ontario, Canada

Holman Bros., Ltd., Camborne, Cornwall, England

Holtzer-Cabot—see National Pneumatic Co., Inc.

Homelite Div., Textron, Inc., Riverdale Ave., Port Chester, New York

Homer Mfg. Co., 142 East Pearl St., Lima, Ohio

Hopkinson, Austin & Co., Ltd., Delta Works, Audenshaw, Manchester, England

Hose Accessories Co., Le-Hi Div., 17th & Lehigh Ave., Philadelphia 32, Pa.

Hose Accessories Co., Champ Industries Div., Lehigh Ave. & 17th St., Phila. 32, Pa.

Hossfeld Mfg. Co., 460-462 West Third St., Winona, Minn.

Hough Co., The Frank G., 859 Sunnyside Ave., Libertyville, Ill.

Houghton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Houston Tool Co., Santa Susana, Calif.

Howe Scale Co., Inc., Rutland, Vermont

Howell Electric Motors Co., 409 N. Roosevelt St., Howell, Mich.

Huber Warco Co., 202 N. Greenwood St., Marion, Ohio

Hudson, Robert, Ltd., Raletux House, Meadow Lane, Leeds 11, York, England

Hughes Tool Co., P.O. Box 2539 Houston 1, Texas

Hulin, Carlton D., 7 Ardilla Rd., Orinda, Calif.

Humboldt, Klockner-Humboldt-Deutz A. G.,—See Diesel Energy Corp. Cologne, Kalk, Western Germany

HUMPHREYS ENGINEERING CO., 916 FIRST NATIONAL BANK BLDG., DENVER 2, COLO.

Hunslet Engine Co., Ltd., The—125, Jack Lane Hunslet, Leeds 10, England

Hunting Associates, Ltd., 1450 O'Connor Dr., Toronto 16, Ontario, Canada

Huntington, Heberlein & Co., Ltd., Simon House, 25-29 Dover St., London, W.1, England

Hycan Aerial Surveys, Inc., 1020 S. Arroyo Parkway, Pasadena, Calif.

Hydraulic Supply Mfg. Co., 7500 8th Ave. So., Seattle, Wash.

Hyster Co., 2002-80 N.E. Clackamas St., Portland 8, Oregon

I

I. H. C. Holland, 2, Verlengde Tolweg, The Hague, Holland

Ideal Corp., 425 Liberty Ave., Brooklyn 7, N.Y.

Ideal Electric & Mfg. Co., Mansfield, Ohio

Ideal Industries, Inc., 3624 Park Ave., Sycamore, Ill.

Illinois Powder Mfg. Co., 506 Olive St., St. Louis, Mo.

Imperial Chemical Industries, Ltd., Imperial Chem. House, Millbank, London, S.W.1, England

Imperial Oil & Grease Co., 6505 Wilshire Blvd., Los Angeles 48, Calif.

Industrial Air Products Co., 3200 N.W. Yeon Ave., Portland 10, Ore.

Industrial Coupler Co., P.O. Box 1751, E. 4218 Boone Ave., Spokane, Wash.

INDUSTRIAL PHYSICS & ELECTRONICS CO., 479 S. 10TH E., SALT LAKE CITY 2, UTAH

Inflico, Inc., 9015 Campbell Ave., Tucson, Ariz.

INGERSOLL, GUY E., 5505 TIMBERWOLF DRIVE, EL PASO, TEXAS

INGERSOLL-RAND CO., 11 BROADWAY, NEW YORK 4, N.Y.

International B. F. Goodrich, 500 South Main St., Akron 18, Ohio

International Combustion Ltd., 19 Woburn Place, London W.C. 1, England

International Engr., Inc., 1145 Bollander Ave., Dayton 1, Ohio

International General Electric Co., 570 Lexington Ave., New York 21, N.Y.

International Geophysics, Inc., 1063 Gayley Ave., Los Angeles, Cal.

INTERNAT'L HARVESTER CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

INTERNAT'L HARVESTER EXPORT CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.

INTERNATIONAL MINERALS & METALS CORP., 11 BROADWAY, NEW YORK 4, N.Y.—SEE ORE BUYERS GUIDE, PG. 139

INTERNAT'L SMELTING & REFINING CO., 818 KEARNS BLDG., SALT LAKE CITY, UTAH

Iowa Mfg. Co., Cedar Rapids, Iowa

Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, Ohio

Irwin Foundry & Mine Car Co., P.O. Box 311, Irwin, Pa.

ISBELL CONSTRUCTION CO., P.O. BOX 2351, RENO, NEVADA

I-T-E Circuit Breaker Co., 19th & Hamilton Sts., Philadelphia 30, Pa.

J

Jacuzzi Bros., Inc., 5327 Jacuzzi Ave., Richmond, Calif.

James Machine Co., 667 Dublin Ave., Columbus, Ohio

James Equipment, Inc., 712 Rockefeller St., Elizabeth, N.J.

Jeffrey Mfg. Co., 861 N. 4th St., Columbus 16, Ohio

Jet-Lube, Inc., 7362 West Beverly Blvd., Los Angeles 36, Calif.

Jet-Lube, Inc., 3039 N. California St., Burbank, Calif.

John-Manville Sales Corp., 22 East 40th St., New York 16, N.Y.

Johnson, Consultants, Herbert B., 804 Franklin St., Clearwater, Fla.

Johnson Block Co., Box 1432, 501 S. Rockford St., Tulsa, Okla.

JOHNSON, HERBERT BANKS, 804 FRANKLIN ST., CLEARWATER, FLA.

Johnson Loading Supplies, G. R., 5026 Butterworth Rd., Mercer Is., Wash.

JOHNSON MARCH CORP., 1724 CHESTNUT ST., PHILADELPHIA 3, PA.

Johnston Pump Co., 3272 E. Foothill, Pasadena, Calif.

Jones, Philip L., 405 Miners Bank Bldg., Joplin, Mo.

Jones & Laughlin Steel Corp., 8 Gateway Center, Pittsburgh 30, Pa.

Joost Mfg. Co., 742 Bancroft Way, Berkeley, Calif.

JOY MFG. CO., HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.

Junction Bit & Tool Co., P.O. Box 1951, Grand Junction, Colo.

Justrite Mfg. Co., 2061 N. Southport, Chicago 14, Ill.

K

Kaelble, Carl GmbH, Backnang Nr. Stuttgart, W. Germany

Kaiser Aluminum & Chem. Corp., 1924 Broadway, Oakland 12, Calif.

Kaiser Engineers, 1924 Broadway, Oakland 12, Calif.

Kaiser Steel Corp., 1924 Broadway, Oakland, Calif.

Ka-Mo Tools, Inc., 1845 So. 55 Ave., Cicero 50, Ill.

Kane, Wm. G., Apartado 1061, Monterey, N.L. Mexico, 1624 Milam Bldg., San Antonio, Texas

Kato Engineering Co., 1415 First Ave., Mankato, Minn.

Katolight Corp., 1st Ave. at Chestnut, Mankato, Minn.

Kansas City Hay Press Co., 801 Woodweather Road, Kansas City, Mo.

Keegel, C. P., 1721 S. 14th St., Las Vegas, Nevada

KEENEY, PAUL E., CO., 1125 S. E. GRAND AVE., PORTLAND 14, ORE.

Kema, (Kohn-Ehrenfelder Maschinenbau-Austalt GmbH) Vogelsangerstr., 250, Kohn-Ehrenfeld, Germany

KENNAMETAL INC., MININGTOOL DIV., BEDFORD, PA.

KENNEDY-VAN SAUN MFG. & ENG. CORP., TWO PARK AVE., NEW YORK 16, N.Y.

KENWORTH MOTOR TRUCK COMPANY, 2801 E. MARGINAL WAY, P.O. BOX 3505, SEATTLE, WASH.

Kern Instruments, Inc., 120 Grand St., White Plains, N.Y.

Keuffel & Esser Co., 800 Adams St., Hoboken, N.J.

Keystone Lubricating Co., 21st & Lippicott
Sta., Philadelphia 32, Pa.
Kilde, Walter & Co., Inc., 456 Main St.,
Belleville 9, N.J.
King Powder Co., The, P.O. Box 974, Cincin-
nati, Ohio
Klein, Schaefer & Becker, Stuttgart, Germany
Klockner-Humboldt-Deutz Ag., Koln, Germany
—see Diesel Energy Corp.
Knapp & Bates, Ltd., Africa House, Kingsway,
London W.C. 2 England
**KNAPSACK-GRIESHEIM A.G. (SEE FARB-
WERKE HOESCHT)**
Koebel Diamond Tool Co., 9456 Grinnell Ave.,
Detroit 13, Mich.
**KOEHRING CO., 3026 WEST CONCORDIA
AVE., MILWAUKEE 16, WIS.**
Koehring Southern Co., Manufactures Rd.,
Chattanooga 1, Tenn.
Kohler Co., Kohler, Wis.
Koppers Co., Wood Pres. Div., 700 Koppers
Bldg., Pittsburgh, Pa.
Koppers Co., Inc., Wolman Dept., 700 Koppers
Bldg., Pittsburgh, Pa.
Kraloy Plastic Pipe Co., Inc., 4720 E. Wash-
ington Blvd., Los Angeles 22, Calif.
Krebs, Kellogg, 564 Market St., San Francisco
4, Calif.
Krogh Pump & Equipment Co., 515 Harrison
St., San Francisco, Calif.
Krupp, Fried. Maschinen un Stahlbau, Rhein-
hausen, W. Germany
Kuhlman Electric Co., Box 289, Birmingham,
Michigan
KW-Dart Co., 2623 Oak St., Kansas City 8, Mo.

L

LaBour Co., 1607 Sterling Ave., Elkhart, Ind.
**LAKE SHORE INC., LAKE SHORE ENG.
DIV., BOX 911, IRON MTN., MICH.**
Lancashire Dynamo & Crypto Ltd., Trafford
Park, Manchester 17, England
Landis Steel Co., Box 248, 116 West A St.,
Picher, Okla.
LaRoe Instruments, Inc., 1709 B. Rockville
Pike, Rockville, Maryland
Laughlin Co., Thomas, 443 Fore St., Portland
6, Maine
Laylander, Philip A., Box 25, Sierra Madre,
Calif.
Lead Lined Iron Pipe Co., 33 Broadway, Wake-
field, Mass.
**ELECTROMELT FURNACE CO., PITTS-
BURGH, PA.**
**LEDEEN MFG. CO., 3333 N. GILMAN RD.,
EL MONTE, CALIF.**
Ledoux & Co., 359 Alfred Ave., Teaneck, N.J.
Leeds & Northrup Co., 4970 Stenton Ave.,
Phila. 44, Pa.
Lee Rubber & Tire Corp., Republic Rubber
Div., 1410 Albert St., Youngstown, Ohio
Lefax, Ninth & Sansom Sts., Phila. 7, Pa.
Lehigh Safety Shoe Co., First & Minor Sts.,
Emmaus, Pa.
Leonard Electric Mfg. Co., 3907 Perkins Ave.,
Cleveland 14, Ohio
Lerlab Supply Co., P.O. Box 810, Hibbing,
Minn.
Lerch Bros. Inc., P.O. Box 810, Hibbing, Minn.
Le Roi Div., Westinghouse Airbrake Co., 3716
W. Wisconsin Ave., Milwaukee, Wis.
Leschen Wire Rope Div., H. K. Porter Co.,
2727 Hamilton Ave., St. Louis 12, Mo.
**LETOURNEAU-VESTINGHOUSE CO., 2301
N. ADAMS ST., PEORIA, ILL.**
Libu Shovel Co. AB, Sturevagen 18, Stock-
holm, Sweden
Lima Electric Motor Co., Findlay Road, Lima,
Ohio
**LINATEX CORP. OF AMERICA, VERNON
AVE., ROCKVILLE, CONNECTICUT**
Lincoln Electric Co., 22801 St. Clair Ave.,
Cleveland 17, Ohio
Linde Air Products Co., 30 E. 42nd St., New
York 17, N.Y.
**LINK-BELT CO., PRUDENTIAL PLAZA,
DEPT. WMD-57, CHICAGO, ILL.**
Link-Belt Speeder Corp., 1201 Sixth St., S.W.,
Cedar Rapids, Iowa
Lintz, Mark, 275 Middlefield Dr., San Fran-
cisco 27, Calif.
Lippmann Engineering Works, 4603 W. Mitch-
ell St., Milwaukee 14, Wis.
Liquid-Solid Separations Ltd., 2 Anderson St.,
London, S.W.3, England
Lister-Blackstone, Inc., 42-32 21st St., Long
Island City 1, N.Y.
**LIVE ROLLER MILLS MFG. CO., 476 E.
TWIN FRENCH 34, CALIF.**
**LIVINGSTON & WILSON EXPLORATION &
DRILLING CO., LONGMONT, COLO.**
Loesch, Hartzerkleinerungs-u. Zementma-
schinen K.G. Steinstrasse 18—Dusseldorf,
W. Germany
Locomotive Crane Div., McDowell Co., Inc.,
The
**LOGAN ENGR. CO., 4901 WEST LAWRENCE
AVE., CHICAGO 30, ILL.**
**LONGYEAR CO., E. J., 1700 FOSHAY
TOWER, MINNEAPOLIS 2, MINN.**
**LOOPBOUROW, R. L., 4632 QUEEN AVE.
80, MINNEAPOLIS 14, MINN.**
Los Angeles Scientific Instrument Co., 2451
Riverside Drive, Los Angeles 39, Calif.

Lowell Insulated Wire Corp., P.O. Box 571,
Pawtucket, R.I.
Ludlow-Saylor Wire Cloth Co., 634 South New-
stead Ave., St. Louis 10, Mo.
Lufkin Rule Co., Saginaw, Mich.
Lug-All Co., 356 E. Lancaster, Haverford, Pa.
Lundberg Exploration, Ltd., 96 Eglinton Ave.
E., Toronto 12, Ontario, Canada
Lunkenheimer Corp., Beekman St. & Waverly
Ave., Cincinnati 14, Ohio
Lurgi-Ges. f. Chemi & Huetteneisen m.b.H.,
Lurgihaus, Gervinusstrasse, Frankfurt
Main, Germany
Lynn Engr. Co., Russ Building, San Francisco
4, Calif.

M

M-H Standard Corp., 615 Communipaw Ave.,
Jersey City 4, N.J.
MRS Mfg. Co., Jackson, Miss.
MacAfee & Co., 3105 Wilshire Blvd., Los An-
geles 6, Calif.
MacBeth Instrument Corp., P.O. Box 950, New-
burgh, N.Y.
**MACE CO., THE, 2763 BLAKE STS., DEN-
VER 5, COLO.**
Mack, Peter, Box 808, Denver 2, Colo.
**MACK TRUCKS, INC., EMPIRE STATE
BLDG., NEW YORK 1, N.Y.**
MacMillan Petroleum Corp., 530 W. Sixth St.,
Los Angeles 14, Calif.
MacWhyte Co., 2998 14th Ave., Kenosha, Wis.
Maddox Foundry & Machinery Works, Archer,
Fla.
MAGMA COPPER CO., SUPERIOR, ARIZONA
Magnetic Engineering & Mfg. Co., 851 Van
Houten Ave., Clifton, N.J.
Magar Car Corp., 50 Church St., New York 7,
N.Y.
**MAHOGANY IMPORTING CO., 725 S.
SPRING ST., LOS ANGELES 14, CALIF.**
Majac, Inc., 23rd St. & P.R.R., Sharpsburg 15,
Pa.
Mancha Storage Battery Locomotive Div.,
Goodman Mfg. Co., Halsted & 48th Pl.,
Chicago 9, Ill.
Manchester Bilt Corp., 11 Broadway, N.Y. 4,
N.Y.
**MANITOWOC ENGINEERING CORP. SOUTH
15TH ST., MANITOWOC, WIS.**
Mannesmann Export G.m.b.H., Thomasstrasse
6, Dusseldorf, Germany
**MANNING CO., CHAS. E., 4700 CLAIRTON
BLVD., PITTSBURGH 36, PA.**
**MARION POWER SHOVEL CO., 617 W.
CENTER ST., MARION, OHIO**
Markley Dust Control System, Inc., 80 Snyder
Road, Ramsey, N.J.
Marlin-Rockwell Corp., 402 Chandler St.,
Jamestown, N.Y.
Marlow Pumps Div., Bell & Gossett Co., Box
200, Midland Park, N.J.
Marmon-Herrington Co., Inc., 1511 W. Wash-
ington St., Indianapolis 7, Ind.
Martindale Electric Co., 1332 Hird Ave.,
Cleveland 7, Ohio
Maschinenfabrik Augsburg-Nurnberg A.G.
(M.A.N.) Nurnberg, West Germany
Master Electric Co., 126 Davis Ave., Dayton 1,
Ohio
Mather & Platt Ltd. Park Works, Manchester
10, England
Matheson Co., Inc., 827 St. & Manhattan
Rd., Joliet, Ill.
Matheson Co., Inc., 327 Paterson Plank Rd.,
P.O. Box 85, East Rutherford, N.J.
Mavor & Coulson Ltd., Bridgeton Glasgow
S.E., Scotland
Mayhew Supply Co., 4700 Seyene Rd., Dallas,
Texas
**MAYO TUNNEL & MINE EQUIP., BOX 1413,
LANCASTER, PA.**
McCauley Industrial Corp., 1840 Howell Ave.,
Dayton, Ohio
McClintock Co., R. S., W. 418-2nd Ave., Spo-
kane, Wash.
McDonald, T. J., 14408 St. Marys, Detroit 27,
Mich.
McDowell Co., Inc., The, 3293 W. 71st St.,
Cleveland 2, Ohio
McKenzie & Whittle Cont., P.O. Box 5602,
Dallas, Texas
**MCNANAHAN & STONE CORP., HOLLI-
DAYSBURG, PA.**
**MCMILLAN, W. D., 1009 GRANT ST., APT.
9, DENVER 3, COLO.**
McNally Pittsburgh Mfg. Corp., Drawer D,
307 W. 3rd St., Pittsburgh, Kansas
Meissner Engr. Inc., John F., 308 W. Wash-
ington, Chicago 11, Ill.
Menardi & Co., 1222 E. Grand Ave., El Se-
gundo, Calif.
Menck & Hambrook GmbH, Hamburg-Altona,
Germany
Menlo Research Lab., Box 522, Menlo Park,
Calif.
Merck & Co., Lincoln Ave., Rahway, N.J.
**MERRICK SCALE MFG. CO., 180 AUTUM
ST., PASSAIC, N.J.**
Merton Engineering Co. Ltd., Faggs Road, Fel-
tham Middx., England
Metal Carbides Corp., 6001 Southern Blvd.,
Youngstown, Ohio
Metron Instrument Co., 432 Lincoln St., Den-
ver, Colo.

Metropolitan-Vickers Electrical Co., Ltd., Mos-
ley Rd., Trafford Park, Manchester 17,
England
Mexico Refractories Co., Mexico, Mo.
Michigan Pipe Co., 6581 Mill St., Gagetown,
Bay, Mich.
Michigan Tool Co., Manistee Iron Works,
Manistee, Mich.
Miehle-Goss-Dexter, Inc., Star-Kimble Motor
Div., 200 Bloomfield Ave., Bloomfield, N.J.
Micro Switch, div. of Minneapolis-Honeywell
Regulator Co., Chicago & Spring Sts.,
Freeport, Ill.
Mill & Mine Supply, Inc., 505 Lander St.,
Seattle 4, Wash.
Miller Machinery Co., Box 1496, Missoula,
Montana
Mills Iron Works, Inc., 929 North Main St.,
Los Angeles 12, Calif.
Miners Et. Metaux, Societe Anonyme, 28 Rue
Arthur Rozier, Paris XIX, France
Minerals Engineering Co., 417 S. Hill St., Los
Angeles 13, Calif.
Minerals Engr. Co., P.O. Box 1951, 801-4th
Ave., Grand Junction, Colorado
Minerals Exploration Research Corp., 2129
Ford St., Golden, Colo.
Minerals Laboratory, 1303 Grant St., Silver
City, New Mexico
Minerco Corp., 120 Broadway, New York, N.Y.
**MINE SAFETY APPLIANCES CO., 201 N.
BRADDOCK AVE., PITTSBURGH 2, PA.**
**MINE & SMELTER SUPPLY CO., 1422-14TH
ST., DENVER, COLO.**
**MINERS FOUNDRY & MFG. CO., 200
SPRING ST., NEVADA CITY, CALIF.**
Mining & Geophysical Services, Ltd., 123 Victo-
ria St., London S.W.1, England
Minneapolis-Honeywell Heald Div., 130 E.
5th Ave., Denver 3, Colo.
Minneapolis-Honeywell Regulator Co., Indus-
trial Div., Wayne & Windrim Avenues,
Philadelphia 44, Pa.
Minneapolis-Moline Co., P.O. Box 1050, Minne-
apolis 1, Minn.
Minnesota Mng. & Mfg. Co., Irvington Var-
nish & Insulator Div., 6 Argyle Terrace,
Irvington 11, N.J.
**MIRKLEES, RICKERTON & DAY LTD.,
MIRKLEES WORKS, HAZEL GROVE,
STOCKPORT, CHESHIRE, ENGLAND**
Mitchell Mfg. Co., 101 Sherman Ave., New
York 34, N.Y.
Mixermobile Mfg. Inc., 8027 N.E. Killings-
worth, Portland 20, Ore.
Moab Drilling Co., 62 E. Center St., Box 487,
Moab, Utah
Mobile Drilling, Inc., 960 North Pennsylvania
St., Indianapolis 4, Ind.
Mona Industries Inc., 65-75 E. 23rd St., P.O.
Box 1786, Paterson 17, N.J.
Monarch Equipment Co., 6568 Lankershim
Blvd., N. Hollywood, Calif.
Monasent Chemical Co., 1700 S. Second St.,
St. Louis 4, Mo.
Morgardshammars Mek. Verkstads AB, Mor-
gardshammer, Sweden
Morris Machine Works Baldwinville, N.Y.
**MORSE BROS. MACHINERY CO., 2800
BRIGHTON BLVD., DENVER, COLO.**
Morse Chain Co., Ithaca, N.Y.
Mosebach Electric & Supply Co., 1115 Arling-
ton Ave., Pittsburgh 3, Pa.
Motor Generator Corp., W. Water St., Troy,
Ohio

N

**MOTOR RAIL LTD., SIMPLEX WORKS,
BEDFORD, ENGLAND**
Motorola Communication & Electronics, Inc.,
4501 W. Augusta Blvd., Chicago 51, Ill.
Mott & Sons, Inc., B. H., Grand Junction,
Colo.
Mott Co. Drilling Co., Mott Bldg., Box 2076,
Huntington, W. Va.
Murphy, F. M., Consulting Geol., 1201 Mary-
land Parkway, Las Vegas, Nev.

New Jersey Meter Co., 120 Waywood Park, Plainfield, New Jersey
 New York Air Brake Co., The, Aurora Pump Div., 86 Loucks St., Aurora, Ill.
 New York-Arizona Development Corp., 614 Mayer-Heard Bldg., Phoenix, Ariz.
 New York Engineering Company, 75 West St., N.Y.C., N.Y.
 Newport Industries Co., Div. of Heyden-Newport Chemical Corp., 342 Madison Ave., New York 17, N.Y.
 Newton, Chambers & Co., Ltd., Thorncliffe Nr. Sheffield, England
 Nice Ball Bearing Co., 30th & Hunting Park Ave., Philadelphia 40, Pa.
 Nichols Engineering & Research Corp., 70 Pine St., New York 5, N.Y.
 Nolan Co., Bowerton, Ohio
 NORDREO MFG. CO., 3073 S. CHASE AVE., MILWAUKEE 1, WIS.
 North American Refractories Co., 1012 Nat'l. City-E 6th St. Bldg., Cleveland 14, Ohio
 NORTHERN BLOWER CO., 6429 BARBERTON AVE., CLEVELAND 2, OHIO
 Northwest Engr. Co., 135 S. LaSalle St., Chicago 3, Ill.
 Norton Co., 1 New Bond St., Worcester 6, Mass.
 Norwood Controls Unit, Detroit Controls Div. of American Standard, 934 Washington St., Norwood, Mass.
 Nuclear-Chicago Corp., 223 W. Erie St., Chicago 10, Ill.
 Nucleonic Corp. of America, 196 Degraw St., Brooklyn 31, N.Y.

O'Donnell & Schmidt, 165 Broadway, New York 6, N.Y.
 Ogden Iron Works Co., 185-23rd St., Box 147, Ogden, Utah
 Ohio Brass Co., 380 North Main St., Mansfield, Ohio
 Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio
 Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland 27, Ohio
 Ohio Gear Co., 1333 E. 179th St., Cleveland 10, Ohio
 Ohio Holst & Mfg. Co., 1811 Shaker Sq., Dept. M.W., Cleveland 20, Ohio
 Ohio Locomotive Crane Co., Bucyrus, Ohio
 OIL TOOL MFG. CO., BOX 712 TONKAWA, OKLA.
 O'Keefe, John J., 822 E. Compton Blvd., Compton, Calif.
 Okonite Co., Hazard Insulated Wire Works Div., 220 Passaic St., N.J.
 Olin Mathieson Chem. Corp., Explosives Div., East Alton, Ill.
 Oliver Corp., 400 W. Madison St., Chicago 6, Ill.
 Oliver Corp., A. B. Farquar Div., 142 N. Duke St., York, Pa.
 Onan Sons, Inc., D. W., 2515 University Ave., S.E., Minneapolis 14, Minn.
 Ore & Chemical Co., 80 Broad St., New York, N.Y.
 Ore Research & Laboratories, 1511 Levee St., Dallas, Texas
 Ore Trucks, Inc., 320 South Grand St., St. Louis, Mo.
 Orenstein-Koppel und Lubecker Maschinenbau AG, Postfach 270, Lubeck, Germany
 Osborne Ltd., Raymond G., 235 W. 27th, Los Angeles 7, Calif.
 Osmond Wood Preserving Co. of America Inc., 980 Elliott St., Buffalo 9, N.Y.
 Overstrom & Sons, 2213 W. Mission Rd., Alhambra, Calif.
 Owen Bucket Co., The, 6001 Breakwater Ave., Cleveland 2, Ohio
 Oxy-Catalyst, Inc., P. O. Box 151, Wayne, Pa.

Pacific Car & Foundry Co., 4th & Factory, Renton, Wash.
 Pacific Coast Engr. Co., Oak & Cement St., P.O. Drawer "E", Alameda 6, Calif.
 PACIFIC FOUNDRY CO., LTD., 3100 19TH ST., SAN FRANCISCO 10, CALIF.
 Pacific Gear & Tool Works, Inc., 1035 Folsom St., San Francisco 3, Calif.
 Pacific Pipe Co., 491 Folsom St., San Francisco, Calif.
 Pacific Wire Rope Co., 1840 E. 15th St., Los Angeles 21, Calif.
 Pacific Wood Tank Corp., 461 Market St., San Francisco 5, Calif.
 Pack Mfg. Co., 55 West 1st North, Logan, Utah
 Page Engineering Co., Clearing Post Office, Chicago 28, Ill.
 Parantine Wire & Cable, Div. Essex Wire Corp., 1601 Wall St., Ft. Wayne, Ind.
 Parker Ltd., Frederick, Viaduct Works, Leicester, Leicestershire, England
 Parker Safety Equip. Co., 785 Lyons Ave., Irvington 11, N.J.

Peale, Rogers, 315 Montgomery St., San Francisco, Calif.
 Peerless Pump Div., Food Machinery & Chemical Corp., 301 W. Ave. 26, Los Angeles 31, Calif.
 Peggson, Ltd., Coalville, Leicestershire, England
 Pena Assoc., Central No. 29 Angostura, Sinaloa, Mexico
 Pence & Co., Inc., Earl H., 2150 Washington Ave., San Leandro, Calif.
 Pendleton Woolen Mills, P.O. Box 275, Washougal, Wash.
 Penn Instrument Div., Burgess Manning Co., 4110 Haverford Ave., Philadelphia, Pa.
 Pennsalt Chemicals Corp., 3 Penn Center, Phila. 2, Pa.
 Pennsylvania Crusher Div., Bath Iron Works Corp., 323 S. Matlack St., West Chester, Pa.
 Pennsylvania Drilling Co., 1205 Chartiers Ave., Pittsburgh 20, Pa.
 Permo Exploration Co., Box 401, Nye, Montana
 Permutit Co., The, 330 W. 42nd St., New York, N.Y.
 Peterson Filters & Engr. Co., 137 Social Hall Ave., Salt Lake City, Utah
 Pettibone Mulliken Corp., 4710 W. Division St., Chicago 51, Ill.
 Phelps Dodge Refining Corp., 40 Wall St., New York 5, N.Y.
 Phelps Dodge Copper Prod. Corp., 300 Park Ave., New York, N.Y.
 Philadelphia Gear Works, Inc., G-St. below Erie Ave. & G. St., Philadelphia 34, Pa.
 Philadelphia Quartz Co., 1146 Public Ledger Bldg., Philadelphia 6, Pa.
 Philip Carey Mfg. Co., Wayne Ave. at Cooper, Cincinnati, Ohio
 Photovolt Corp., 95 Madison Ave., N.Y. 16, N.Y.
 Pick Laboratories, P.O. Box 67, Saratoga, Calif.
 PIGGOTT PROJECTS, 1957 HOWARD ST., SAN FRANCISCO, CALIF.
 Philips Electronics Inc., Instruments Div., 750 South Fulton Ave., Mt. Vernon, N.Y.
 Pierce, Roger V., 808 Newhouse Bldg., Salt Lake City 4, Utah
 Finger, Allen W., 1419 Circle Way, Salt Lake City, Utah
 Pioneer Engineering Div., Poor & Co., Inc., 3200 Como Ave., Minneapolis, Minn.
 Pitman Manufacturing Co., 300 W. 79th Terrace, Kansas City, Mo.
 Plastic Tamping Stick Sales, P.O. Box 49, R.R. 3, Iron River, Michigan
 PLYMOUTH LOCOMOTIVE WORKS, DIV. OF THE FATE-ROOT-HEATH CO., PLYMOUTH, OHIO
 Plugger, Underwasserpumpen GMBH, Hamburg-Wandabek Friedric-Ebert-Damm 101, Germany
 Pohlig, J. (AG), Pohligstr. 1, Koln-Zollstock, West Germany
 Pollock Co., Wm. B., 101 Andrews Ave., Youngstown, Ohio
 Polysius G.m.b.H., Graf-Galenstr. 17, Neu-Beckum, Westf. Germany
 Porter, Inc., H. K., 74 Foley St., Somerville 43, Mass.
 Porter Co., Inc., H. K., Lescon Wire Rope Div., 2727 Hamilton Ave., St. Louis, Mo.
 Porter Co., Inc., H. K., Quaker Rubber Div., Tacony & Comly Streets, Philadelphia, Pa.
 Porter Co., Inc., H. K., W-S Fittings Div., 109 Aldene Road, P.O. Box 95, Roselle, N.J.
 Portland Woolen Mills, Inc., P.O. Box 2620, Portland 3, Ore.
 Porto Tool Co., 3103 Santa Monica Blvd., Santa Monica, Calif.
 Post Co., Frederick, 155 E. Ohio, Chicago, Ill.
 Powermite Drill & Tool Co., 16104 N. High land, Box 691, Hollywood, Calif.
 Precision Radiation Instruments Inc., 4223 W. Jefferson Blvd., Los Angeles 16, Calif.
 Premax, G.m.b.H., Geisenheim (Rhein) Germany
 Price, Franklin L. C., 1105 Northern Life Tower, Seattle 1, Wash.
 Princeton, Ghipholst, Inc., 32 George St., Boston 19, Mass.
 PRODUCTIVE EQUIPMENT CORP., 2926 W. LAKE ST., CHICAGO 15, ILL.
 PROGRESSIVE COLOR & CHEMICAL CO., INC., 350 FIFTH AVE., NEW YORK, N.Y.
 Pulmosan Safety Equip. Corp., 644 Pacific St., Brooklyn 17, N.Y.
 Pulva Corp., 604 High St., Perth Amboy, N.J.
 Pumps, Inc., 323 W. 10th St., Indianapolis 7, Indiana
 Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.
 Pyrene C-O-Two Div., Fyr-Fyter Co., The, P.O. Box 750, Newark 1, N.J.
 Pyrometer Instrument Co., Inc., 92 Portland Ave., Bergenfield, N.J.

Quaker Pioneer Rubber Mills, 530 Fourth St., San Francisco, Calif.

Quaker Rubber Div., H. K. Porter Co., Tacony & Comly Sts., Phila. 24, Pa.
 Quick-Way Truck Shovel Co., 2401 E. 40th Ave., Box 1800, Denver, Colo.

R

Radic Co., Inc., 489 5th Ave., New York 17, N.Y.
 Ramo Ajax Div., American Brake Shoe Co., 332 S. Michigan Ave., Chicago 4, Ill.
 RANKIN MFG. CO., 615 S. MARENGO AVE., ALHAMBRA, CALIF.
 Rapid Magnetic Machines, Ltd., Lombard St., Birmingham 12, England
 Rawson Electrical Instrument Co., 110 Potter St., Cambridge 42, Mass.
 Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N.J.
 Ray Drilling Co., Inc., 343 S. State, Salt Lake City, Utah
 Ray-O-Vac Co., 212 E. Washington Ave., Madison 10, Wis.
 Ray-O-Vac Co., Willson Products Div., 2nd & Washington St., Reading, Pa.
 Ready Power Co., 11231 Freud Ave., Detroit 14, Mich.
 REED ENGINEERING CO., 620 SO. INGLEWOOD AVE., INGLEWOOD, CALIF.
 Reeves Pulley Co., 1225-7th St., Columbus, Ind.
 Reich Bros. Mfg. Co., 1439 Ash St., Terre Haute, Ind.
 Reilly Tar & Chemical Corp., 1615 Merchants Bank Building, Indianapolis 4, Ind.
 Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio
 Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn.
 Republic Rubber Div., Lee Rubber & Tire Corp., Albert St., Youngstown, Ohio
 Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio
 Republic Steel Corp., Bolt & Chain Div., 1970 Carter Rd., Cleveland, Ohio
 Republic Steel Corp., Truscon Steel Div., Albert St., Youngstown 1, Ohio
 Research Cottrell, Inc., P.O. Box 750, Bound Brook, N.J.
 Research Inc., 1511 Lence St., P.O. Box 10243, Dallas, Texas
 Resist-Loy Co., Inc., 1251 Phillips Ave., S.W., Grand Rapids 7, Mich.
 Revere Copper & Brass Inc., 230 Park Ave., New York 17, N.Y.
 Revere Electric Mfg. Co., 6009 Broadway, Chicago 40, Ill.
 Rhoads & Son, J. E., 2100 W. 11th St., Wilmington 99, Del.
 RIBLET TRAMWAY CO., N. 1231 WASHINGTON ST., SPOKANE, WASH.
 Rice Pump & Mach. Co., Belgium, Wisc.
 Richardson Scale Co., 688 Van Houten Ave., Clifton, N.J.
 Rick Helicopter, San Francisco International Airport, San Francisco, Calif.
 Rip-Bla, Ltd., Callywhite Lane, Driffield, Sheffield, England
 Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, Ohio
 Roberts & Schaefer Co., 130 N. Wells St., Chicago 6, Ill.
 Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia 33, Pa.
 Robinson Clay Product Co., The, 65 W. State St., Akron 9, Ohio
 Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.
 Rocky Mtn. Instrument Co., 1410-16th St., Denver, Colo.
 Rodale Mfg. Co., Inc., Emmaus, Pa.
 Roder-Blackburn Intl. Corp., 149 Broadway, N.Y. 6, N.Y.
 ROEBLING'S SONS CORP., JOHN A., 640 S. BROAD ST., TRENTON 2, N.J.
 Rogers Brothers Corp., Albion, Pa.
 Rogers Iron Works Co., Joplin, Mo.
 Rohm & Haas Co., Washington Square, Philadelphia, Pa.
 Roller Bearing Co. of America, Sullivan Way, West Trenton, N.J.
 Rollway Bearing Co., Inc., 541 Seymour St., Syracuse, N.Y.
 Rome Cable Corp., Ridge 56, P.O. Box 71, Rome, N.Y.
 Root & Simpson, Inc., 1310 E. 17th Ave., Denver 18, Colo.
 Roots-Connersville Blower Div., Dresser Industries, 900 W. Mount St., Connersville, Ind.
 Rose Mfg. Co., 2700 West Barbary Place, Denver, Colo.
 ROSS SCREEN & FEDER CO., 100 QUIMBY ST., WESTFIELD, N.J.
 Rothe Erde Eisenwerk G.m.b.H., Dortmund, Germany
 Rotolite Corp., Essex St., Stirling, N.J.
 Round Chain Co.'s., Broadway & Chaincraft Rd., Cleveland 5, Ohio
 Rowan Controller Co., 2313 Homewood Ave., Baltimore 18, Md.
 Ruhrkumstoff G.m.b.H., Mulheim-Ruhr, West Germany
 Ruaton & Hornsby, Ltd., Lincoln, England

Ruston-Bucyrus, Ltd., Lincoln, England
Ruth Co., The, 1437 Blake St., Denver 2, Colo.
Ryerson, Joseph T. & Son, Inc., 2558 W. 16th
St., Chicago 8, Ill.

S

Safety Clothing & Equip. Co., 1990 E. 69
St., Cleveland, Ohio
Safety Fire Extinguisher Co., 293 Seventh St.,
N.Y. 1, N.Y.
Safety First Supply Co., 425 Magee St.,
Pittsburgh 19, Pa.
Sahara Oil Co., 25 E. Main St., DuQuoin, Ill.
Salem Tool Co., 767 S. Ellsworth Ave., Salem,
Ohio
Salzgitter, Salzgitter-Bad, Germany
Sanford-Day Iron Works, Inc., Dale Ave., Box
1511, Knoxville, Tenn.
Santa Fe Tank Div., Fluor Products Co., P.O.
Box 510, Whittier, Calif.
Saracco Tank & Welding Co., 141 S. Maple
Ave., So. San Francisco, Calif.
Sarco & Sarcotherm Controls, Inc., 635 Madison
Ave., New York 22, N.Y.
SAUERMAN BROS., INC., 638 S. 28TH AVE.,
BELLWOOD, ILL.
Saylor Electric Prod. Corp., 277 Pierce St.,
Birmingham, Mich.
Scandinavian Ore Tankers, Public Ledger
Bldg., Philadelphia 22, Pa.
SCHAEFER ASSOCIATES, F. C., P.O.
BOX 54, PARRAL, CHIHUAHUA, MEX-
ICO
SCHAEFFER PLODIMER CO., 2828-
SMALLMAN ST., PITTSBURGH 22, PA.
Scharf, Heinrich G.m.b.H., Hamm (Westfalia),
Germany
SCHIDDELM, F. W., 50 CHURCH ST.,
NEW YORK 7, N.Y.
Schild Bantam Co., Park St., Waverly, Iowa
Schneider Mfg. Corp., 315 N. Franklin St.,
Muncie, Ind.
Schoonmaker Co. Inc., A. C., Box 516, Sausa-
lito, Calif.
Schramm Inc., West Chester, Pa.
Schroter & Lockwood, 3515 Sunset Blvd., Los
Angeles 26, Calif.
Schwartz Mfg. Co., Lester Prairie, Minn.
Scott's Concentrators, P.O. Box 211, Fair
Oaks, Calif.
Screen Equip. Co., Inc., Buffalo 25, N.Y.
Security Engineering Div., Dresser operations,
Inc., P.O. Box 16347, Dallas, Texas
Seismograph Service Corp., P.O. Box 1590,
Tulsa 1, Okla.
Sepor Microsplitter Supply, 1545 S. Oak Park
Ave., Berwyn, Illinois
Service Supply Corp., 20th & Erie Ave.,
Philadelphia 22, Pa.
Shaft & Devel. Mach. Co., 808 Newhouse Bldg.,
Salt Lake City, Utah
SHAMROCK DRILLING ENTERPRISES,
INC., 311 EL HOGAR BLDG., MANILA
P.I.
Sharples Chemicals Inc., 1100 Widener Bldg.,
Philadelphia 17, Pa.
Shawinigan Prod. Corp., 850 5th Ave., N.Y. 1,
N.Y.
Shedwick, Jr., Wm. J., Reforma 20-302;
Mexico 1, D. F.
SHEFFIELD STEEL DIV., ARMO STEEL
CORP., SHEFFIELD STATION, KAN-
SAS CITY 25, MO.
Shell Oil Co., 50 W. 50th St., New York
20, N.Y.
Shepard Niles Crane & Hoist Corp., Schuyler
Ave., Montour Falls, N.Y.
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ST., CAMBRIDGE 39, MASS.
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to
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WRITE
FOR

Bulletin
No. A2-B4

DENVER
Steel-Head

BALL AND ROD MILLS



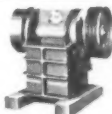
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to
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Forced-Feed

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Bulletin
No. C12-B12

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Simplex
and
Duplex
Capacity
to 1000 g.p.m.

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Disc

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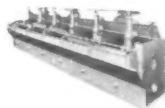
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to
9' dia. x 12 Disc

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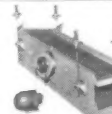
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WILFLEY *centrifugal* PUMPS

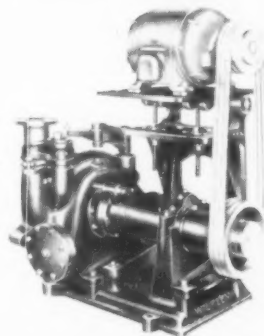
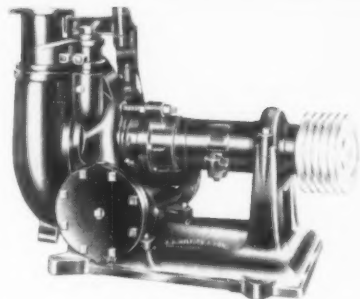


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ON EVERY
INSTALLATION**

The new patented **WILFLEY MODEL "K"** centrifugal sand pumps are designed for maintained high efficiency in rugged service and trouble-free operation. They combine the original WILFLEY principles with new improvements developed through years of engineering experience.

BELT DRIVEN, overhead V-belt driven and direct driven WILFLEY Model "K" pumps available in 1", 1½", 2", 2½", 3", 4", 5", 6", and 8" discharge sizes with capacities to 3000 GPM and heads as high as 200'.

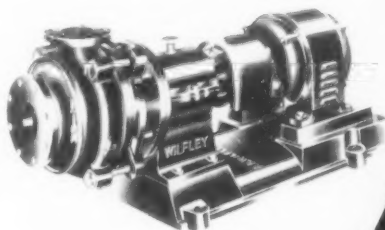
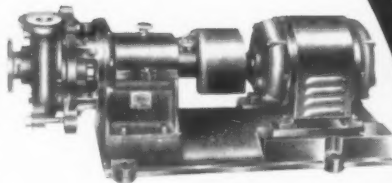
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